# *"EFFECTIVENESS OF CO-OP TO IMPROVE SHOPPING SKILLS IN CHILDREN WITH LEARNING DISABILITY"*

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**CHENNAI**

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# CERTIFICATE

This is to certify that the research work entitled **"EFFECTIVENESS OF CO-OP TO IMPROVE SHOPPING SKILLS IN CHILDREN WITH LEARNING DISABILITY"** carried out by **Reg. No.411513003**, towards partial fulfillment of the requirements of Master of Occupational Therapy (Advanced OT in Pediatrics), at KMCH College of Occupational Therapy (2015-2017), under the Tamil Nadu Dr. M.G.R. Medical University, Chennai.

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# ABSTRACT

## AIM

To find out effectiveness of CO-OP to improve shopping skills in children with learning disability

## METHODOLOGY

The study was conducted in Rashmika centre and Cognito Academy in Coimbatore for 36 sessions within 12 weeks. Totally 30 children diagnosed with learning disability based on inclusion and exclusion criteria were included in this study and children were divided into two groups 15 in experimental group and 15 in control group. Assessment tools like TOGSS, COPM and PQRS were used as outcome measures. Experimental group underwent regular occupational therapy and COOP intervention and control group underwent regular occupational therapy and money handling skills training for 36 sessions. Scores obtained were subjected to statistical analysis.

## RESULTS

Statistical analysis using independent t-test to compare pre and post test scores between experimental and control group showed significant improvement in shopping skills. Statistical analysis of pretest and posttest scores of TOGSS where p is 0.001(<0.05), TOGSS accuracy and efficiency of item, size, price, and time component where p is 0.001 (<0.05), COPM and PQRS [where p is 0.001(<0.05)], of PQRS of performance component in reading list, item, size, and price and money handling component where p is 0.001and 0.000 (<0.05). Effect size of TOGSS, COPM and PQRS was increased in experimental group.

## CONCLUSION

COOP approach showed significant improvement in shopping skills for learning disability children, learning disability children were satisfied with their performance. Thus COOP approach is effective in improving shopping skills for learning disability children.



**Key words: Shopping, CO-OP (Cognitive oriented daily occupational performance), learning disability.**

# CANADIAN OCCUPATIONAL PERFORMANCE MEASURE

**Authors:**
**Mary Law, Sue Baptiste, Anne Carswell,**
**Mary Ann McColl, Helene Polatajko, Nancy Pollock**

The Canadian Occupational Performance Measure (COPM) is an individualized measure designed for use by occupational therapists to detect self-perceived change in occupational performance problems over time.

| Client Name: | | |
|---|---|---|
| Age: | Gender: | ID#: |
| Respondent (if not client): | | |
| Date of Assessment: | Planned Date of Reassessment: | Date of Reassessment: |

| Therapist: |
|---|
| Facility/Agency: |
| Program: |

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## STEP 1:
## IDENTIFICATION OF OCCUPATIONAL PERFORMANCE ISSUES

To identify occupational performance problems, concerns and issues, interview the client, asking about daily activities in self-care, productivity and leisure. Ask clients to identify daily activities which they want to do, need to do or are expected to do by encouraging them to think about a typical day. Then ask the client to identify which of these activities are difficult for them to do now to their satisfaction. Record these activity problems in Steps 1A, 1B, or 1C.

## STEP 2:
## RATING IMPORTANCE

Using the scoring card provided, ask the client to rate, on a scale of 1 to 10, the importance of each activity. Place the ratings in the corresponding boxes in Steps 1A, 1B, or 1C.

## STEP 1A: Self-care

IMPORTANCE

**Personal Care**
(e.g., dressing, bathing, feeding, hygiene)

_____ ☐
_____ ☐
_____ ☐

**Functional Mobility**
(e.g., transfers, indoor, outdoor)

_____ ☐
_____ ☐
_____ ☐

**Community Management**
(e.g., transportation, shopping, finances)

_____ ☐
_____ ☐
_____ ☐

## STEP 1B: Productivity

**Paid/Unpaid Work**
(e.g., finding/keeping a job, volunteering)

_____ ☐
_____ ☐
_____ ☐

**Household Management**
(e.g., cleaning, laundry, cooking)

_____ ☐
_____ ☐
_____ ☐

**Play/School**
(e.g., play skills, homework)

_____ ☐
_____ ☐
_____ ☐

## STEP 1C: Leisure

IMPORTANCE

**Quiet Recreation**
(e.g., hobbies, crafts, reading)

**Active Recreation**
(e.g., sports, outings, travel)

**Socialization**
(e.g., visiting, phone calls, parties, correspondence)

## STEPS 3 & 4: SCORING - INITIAL ASSESSMENT and REASSESSMENT

Confirm with the client the 5 most important problems and record them below. Using the scoring cards, ask the client to rate each problem on performance and satisfaction, then calculate the total scores. Total scores are calculated by adding together the performance or satisfaction scores for all problems and dividing by the number of problems. At reassessment, the client scores each problem again for performance and satisfaction. Calculate the new scores and the change score.

### Initial Assessment:

### Reassessment:

| OCCUPATIONAL PERFORMANCE PROBLEMS: | PERFORMANCE 1 | SATISFACTION 1 | PERFORMANCE 2 | SATISFACTION 2 |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |

**SCORING:**

Total score = Total performance or satisfaction scores / # of problems

| PERFORMANCE SCORE 1 | SATISFACTION SCORE 1 | PERFORMANCE SCORE 2 | SATISFACTION SCORE 2 |
|---|---|---|---|
| / = | / = | / = | / = |

CHANGE IN PERFORMANCE = Performance Score 2 – Performance Score 1 =

CHANGE IN SATISFACTION = Satisfaction Score 2 – Satisfaction Score 1 =

## ADDITIONAL NOTES AND BACKGROUND INFORMATION

**Initial Assessment:**

**Reassessment:**

# INTRODUCTION

Occupation has been defined as "daily activities that reflect cultural values, provides structure to living and meaning to individuals; these activities meet human needs for self-care, enjoyment, and participation in society" [1]

Occupational therapy practioners consider the many types of occupations in which clients might engage. The broad range of activities or occupations are sorted into categories called "areas of occupation", they are activities of daily living(ADL), instrumental activities of daily living (IADL), rest and sleep, education, work , play, leisure and social participation.

In occupational therapy practice framework (OTPF), AOTA defines IADLs as "activities that are oriented toward interacting with environment and that are often complex in nature." IADL include 11 activity categories as care of others, care of pets, child rearing, communication device use, community mobility, financial management, health and maintenance, home establishment and management, meal preparation and clean up, safety procedures and emergency responses, shopping.[2]

Children with learning disability may have difficulty in some or all of the activities of reading, writing, and arithmetic. This can present them with numerous obstacles in the area of IADL (instrumental activities of daily living). For example, clients with reading deficits may have difficulty with community mobility (using public transportation) because they are unable to read bus schedules. If clients have difficulty with writing or arithmetic, they may have difficulty with financial management (not able to write what they need to shop or to shop independently).[3]

Grocery shopping is a weekly routine for many; is actually composed of multiple activities (Mechling & Gast, 2003). Mechling and Gast (2003)[4] outlined these activities as

(a) Identifying items to purchase,

(b) Moving around a store,

(c) Selecting the appropriate item,

(d) Addressing prices, and

(e) Purchasing the item(s).

A research article published in Indian Journal of Occupational therapy in the year 2012 reports that children with learning disability were more dependent in shopping skills than typical children

Diane Cotterill,[5] (2015) found that shopping experience promotes independence, choice, and engagement in a valued occupation to meet leisure and self care needs and opportunities for social and recreational experience.

Shopping experience will promote cognitive and social development and understanding sequences of events involved in shopping is clearly one of the most important aspects of transaction knowledge.[6]

The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach was used within this study as "a client-centered, performance-based, problem solving, intervention that enables skill acquisition through a process of strategy use and guided discovery."[7]

Children with Learning disability have normal intelligence but they will have difficulties in learning and using academic skills.

COOP is a performance-based approach that emphasizes the importance of enabling the adolescent to identify, develop and utilize cognitive strategies to manage their chosen occupational life skill goals more effectively [8]

CO-OP developed as an intervention approach as a result of research being performed with children with Developmental Coordination Disorder (DCD), Cognitive Orientation to daily Occupational Performance (COOP) is an individualized, client-centered approach focused on strategy-based skill acquisition[7]

To date, CO-OP approach is not done in learning disability to improve shopping skills. Hence the study is needed to find out effectiveness of CO-OP to improve shopping skills in children with learning disability.

# RESEARCH QUESTION

Will CO-OP be effective in improving Grocery shopping skills in children with learning disability?

# OPERATIONAL DEFINITION

## SHOPPING

Preparing shopping lists (grocery and other); selecting, purchasing, and transporting items; selecting method of payment; and completing money transactions.

## OCCUPATION

Occupation is everything people do to occupy themselves, including looking after themselves…enjoying life…and contributing to the social and economic fabric of their communities" [1]

## COGNITION

Mental action or process of acquiring knowledge through thought, experience, and the senses

## SKILL ACQUISITION

The process of learning to perform task or set of tasks

## CLIENT CENTERED THERAPY

The client will take an active role in his or her therapy with the therapist being nondirective and supportive.

## PROBLEM SOLVING

Problem solving is a mental process that involves discovering, analyzing and solving problems. The ultimate goal of problem solving is to overcome obstacles and to find solution.

# AIM AND OBJECTIVES

## AIM

To find out effectiveness of co-op to improve shopping skills in children with learning disability

## Objectives

- To improve shopping skills in children with learning disability by using CO-OP approach.
- To find the children with learning disability satisfactions on performance

# HYPOTHESES

## HYPOTHESIS

CO-OP will be effective to improve shopping skills in children with learning disability.

### NULL HYPOTHESIS

COOP will not be effective to improve shopping skills in children with learning disability

# RELATED LITERATURE

## DEFINITION OF LEARNING DISABILITY

The APA criterion says a specific learning disorder diagnosis *"*requires persistent difficulties in reading, writing, arithmetic or mathematical reasoning skills during formal years of schooling. Current academic skills must be well below the average range of scores in culturally and linguistically appropriate tests of reading, writing, or mathematics. The individual's difficulties must not be better explained by developmental, neurological, and sensory (vision or hearing), or motor disorders and must significantly interfere with academic achievement, occupational performance, or activities of daily living.*"*

## SHOPPING KNOWLEDGE AND SKILLS

We use the term "shopping skills" to refer to wide array of abilities used for comparing product value prior to purchase.

Children are frequent visitors to retail stores at a young age. Convenience stores, discount stores, and supermarkets are the favorites of younger children (5–9 years), while specialty stores, such as toy or sporting good stores, are favorites with older children (10–12 years; McNeal and McDaniel 1981). By the time a child reaches middle childhood, s/he is visiting and making purchases in an average of 5.2 stores per week, or over 270 shopping visits per year (McNeal 1992).

Research reported between preschool or first or second grade children learns and understand fast where money comes from and its role in transaction in market place also learns to identify coins and bill value.

These shopping experiences, coupled with developments in cognitive and social reasoning.

## DEVELOPMENT OF SHOPPING SKILLS

McNeal (1964) reports interesting developments between the ages of 5 and 9 years of age.

At age 5, children see stores as a source for snacks and sweets, but are unsure of why stores exist except to fulfill their own needs for these products.

By the time children reach the age of 7, shopping is seen as "necessary and exciting."

At age 9, shopping is seen as a "necessary part of life," accompanied by a much greater understanding that retail stores are owned by people to sell goods at a profit.

The perceptual stage, where children have an egocentric perspective

To the analytical stage, where children have the ability to reason from another person's perspective, such as retailers who have a profit motive detailed knowledge about retail stores also expands during this age period.

In a study, McNeal (1992) asked children in second, third, and fourth grade to draw pictures of "what comes to mind when you think about going shopping." Findings from a content analysis of the pictures supports the fact that older children understand the process and purpose of shopping and include a variety of retailers (supermarkets, specialty stores, discount and department stores) in their depictions. Children's drawings reveal that their shopping experiences have resulted in a good deal of knowledge about aspects of store layouts, product offerings, brands, and the like. As McNeal concludes : "By the time children are in the third and fourth grades, they can provide detailed descriptions of a Kmart or Kroger store, including store layouts, product and brand offerings of items for children and their households, and names and characteristics of some people who work in stores."

Karsten (1996) in a study conducted with children in kindergarten through fourth grade who were asked to participate in a shopping game. Each child was shown a small toy with a price tag on it (e.g., a toy dinosaur for 17 cents) and told that they had been given money (e.g., a quarter) by their mother to buy the item at the store and he concludes "Even the youngest subjects in the study understood that one selected their item, checked their money, decided what to purchase and placed it on the cashier's counter, waited for the cashier to check and record the price and perhaps offer change— they even reminded the interviewer to hand them a pretend receipt."

## INTERVENTION FOR SHOPPING SKILLS

## COMMUNITY BASED INSTRUCTION

Community-Based Instruction (CBI)=Regular and systematic instruction in meaningful, functional, age appropriate skills in integrated community settings, using naturally occurring materials and situations, designed to help the student to acquire and generalize life-skills that enhance his/her opportunities for meaningful experiences and relationships within the general community. Instruction is driven by individual strengths and needs, using consistent teaching strategies, as well as accommodations designed to enhance the student's participation in typical activities. Home settings or area surroundings such as shopping centers, convenience stores and/or grocery stores, as well as community resources such as public libraries and post offices; take on importance as potential instructional settings. Also, students may learn important skills such as travel training, pedestrian skills, money use and management, leisure skills, and restaurant use. For older students, the community also includes vocational settings**.**

CBI is designed to increase independent living and social interactions for students with cognitive disabilities, careful planning must take place prior to beginning instruction. Educational staffs are charged with determining the student's needs and matching these needs with the proper instructional setting. Educators must take into account what family members view as important skills for both current and future environments.

## COGNITIVE ORIENTATION OF DAILY OCCUPATIONAL PERFORMANCE(CO-OP)

### The co-op objectives

The co-op protocol was designed to meet four specific objectives.

### Skill Acquisition

It is the primary objective of co-op and occupies the foreground during much of the intervention. In this performance- based approach children learn to perform three specific skills. Typically these are everyday skills, which they need to, want to, or are expected to perform at school, at home or at play.

**Cognitive strategy use**

It is instrumental to skill acquisition in the co-op approach. Thus the second objective of co-op is to teach children to use strategies to solve their performance problems. Children are actively taught a problem- solving strategy and are enabled to discover additional strategies that will support their skill acquisition and performance competence.

**Generalization of learning**

Beyond the therapy situation is of key concern in a learning- based approach such as co-op. thus the third objective of the coop approach is to have the children use their newly learned skills and strategies outside of therapy, without the help of the therapist in real world settings.

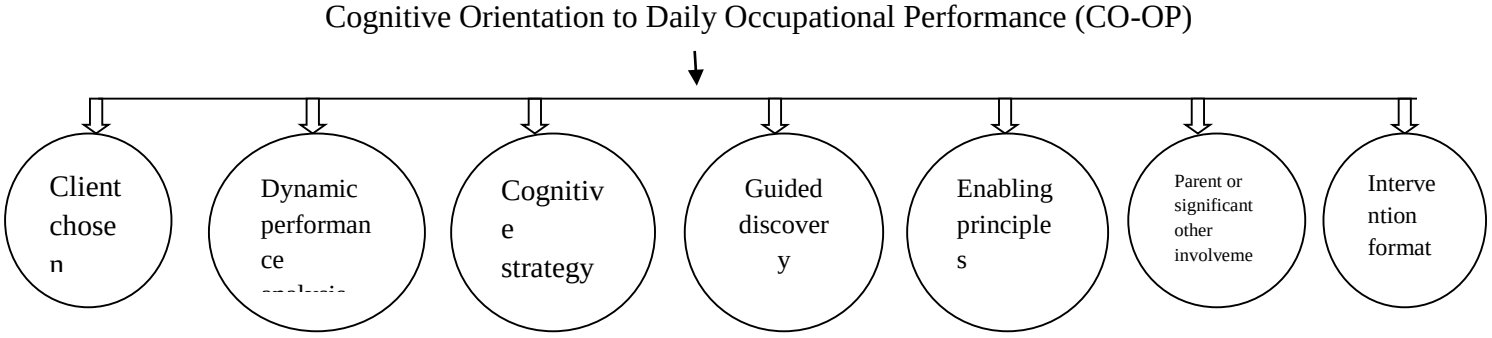
**Transfer of learning**

Skills to similar skills are the fourth and final objective of co-op. it is important that children learn to adapt their skills and strategies to the demands of new skills that they encounter in everyday life.

**The seven key features of co-op**

Each of the seven key features is essential to co-op's effectiveness. Together the key features define CO-OP as,

A client-centered, performance – based, problem solving approach that use strategies, identified through a process of guided discovery, to enable skill acquisition



**Client- chosen goals**

CO-OP is a performance – based approach with the primary objective being skill acquisition. The child learns to perform three specific skills during CO-OP intervention. These skills referred to as GOALS, are the focal point of the intervention and are the vehicle for addressing the other three objectives of CO-OP.

The goals are set in collaboration with the child and great care is taken to ensure that Goals are the ones that the child wants to, needs to or is expected to acquire. In the CO-OP approach the child's perspective is of central importance, beginning with the process of setting child- chosen goal, and continuing through the intervention.

**Dynamic performance analysis (DPA)**

Dynamic performance analysis is used in CO-OP intervention to support skill acquisition and the identification of the appropriate strategies for successful performance. It is initiated during baseline, when the child first performs his goal skill for the therapist, and continues throughout the treatment. The objective is twofold: to identify performance problems or breakdown, and to identify and test potential strategies to solve the performance problems.

**Cognitive strategy use**

In CO-OP, children are taught to think their way through a performance problem; to identify a strategy to solve that problem, and then to implement it. The CO-OP approach is highly verbal. The use of talk and self talk is so important to CO-OP that it was originally called verbal- self guidance. (**Wilcox and Polatajko, 1993, 1994)**

Throughout Through modeling, the therapist teaches the child to talk through the solution of a performance problem and to talk himself through the actual performance i.e., verbal self guidance.

The CO-OP approach uses strategies to facilitate this process of 'talking through'. The strategies help the child engage in problem solving a performance issue and monitoring the outcome. In other words the strategies promote Meta cognition.

Meta cognition is thinking about one's thinking (**flavell, 1979)** it is awareness of what skills, strategies and resources are needed to perform a task effectively.

The COOP global strategy and its Meta cognitive – functions

| Global strategy | Promoting | |
|---|---|---|
| | Self talk | Meta cognitive functions |
| Goal | What do I want to do? | Self-interrogation |
| Plan | How am I going to do it? | Self –monitor |
| Do | Do it ( carry out the plan) | Self observation |
| Check | How well did my plan work? | Self-evaluation<br>Self –reinforcement |

**Global strategy: goal- plan- do- check**

A global cognitive strategy, also referred to as an executive strategy, is a higher order strategy that is used to control and co-ordinate other strategies (**Pressely et al., 1987).** The global strategy used in CO-OP is the Goal- plan- do- check strategy developed by a camp of colleagues (1976) and used by **Meichenbaum (1977-1991).** It is a problem solving strategy that helps to structure the conversation about skill performance.

Meichenbaum argues that children can learn to regulate their own behavior by instructing themselves to identify a goal, develop a plan, enact the plan, and evaluate its success. He suggests that this problem solving structure needs first to be modeled by a competent adult, then stated aloud by the child, then internalized and recalled covertly by the child.

**Domain specific strategies**

Domain specific strategies (DSS) are strategies that are specific to a particular task or part of a task. While the global strategy provides a general frame work that is used throughout the intervention ( and after) and is applied to the acquisition of all skills by all children , the domain specific strategies are often used only for a short time and are task, child, and situation specific. Further, while the global strategy is specified a prior, domain specific strategies are not. They are introduced to solve specific performance issues as they arise. They are tailor made for each child, in each situation. The domain specific strategies one child uses to learn a specific skill may be different from those used by another child to learn the same skill. Similarly, the same child may use several different DSS's while learning a skill.

**Guided discovery**

Guided discovery is a process created for use in CO-OP to make certain that children discover the strategies that will solve their performance problems, themselves. While it is possible to use strategies without using guided discovery.

Guided discovery is an important learning concept. As well, it draws on Meichenbaum (1977,1991) scaffolding techniques, and the meditational techniques of Feuerstein and colleagues ( Feuersyein, rand, Hoffman & miller, 1980; haywood,1987,1988). Guided discovery, where the adult leads the child to discover answers to problems, has been shown to be more effective than discovery learning, where the child is left to discover the answer on his own (Collins & stevens, 1982)

**Enabling principles**

CO-OP has its foundation in the client- centered philosophy of occupational therapy, which focuses on enabling people to perform the occupations they want to, need to, or are expected to perform. As defined by CAOT (1997), "enabling refers to a process of facilitating, guiding, coaching, educating, promoting, listening, reflecting, encouraging, or otherwise collaborating with people, so that individuals, groups, agencies, or organizations have the means and opportunity to participate in shaping their own lives." Occupational therapists use the term enabling rather

treatment, because treatment implies that things are done to or for someone rather than with someone.

The enabling principles are an integral part of the approach, and are used throughout the intervention. They are captured in four imperatives:

- Make it fun!
- Promote learning!
- Work towards independence!
- Promote generalization and transfer!

Parent or significant other involvement

Both parents and health care professional have identified parent involvement as one of the most important aspects of care, and have highlighted parent involvement as a priority in the development of health services (**rosenbaum, king, & Cadman, 1992).** In CO-OP, parents or significant others are called on to be active supporters of the intervention process. This is the sixth key feature of CO-OP.

The primary role of parents or significant others is to support the child in the acquisition of new skills and to facilitate the generalization and transfer of these. Throughout the intervention, the therapist shares information with the parents or significant others, so that they can celebrate the child's successes with him and support his use of newly learned skills and strategies in environments beyond the intervention sessions.

Research indicates that students can achieve better outcomes at school when there is strong parental involvement (Willms, 1996). Follow-up studies of behavior therapy have shown that children whose parents have been taught the behavioral techniques continue to improve and demonstrate generalization and transfer to areas that had not been specific treatment targets.

# REVIEW OF LITERATURE

- **Richa sachdeva (M.O.T) in 2012** did a study to compare the money handling skills of children with learning disability and children with typical development. In this study, **author has taken 139 children with typical development and 31 with learning disability aged 10-14 years** studying in integrated schools. The children were divided into two groups based on their standards an age **Group 1- 5th and 6th std (10-11 years)**, **Group 2- 7th, 8th and 9th std (13-14 years)**. A student questionnaire on financial community living skills was developed and administered on the children; **author found that children with typical development are more independent than the children with learning disability of the same age and none of children with typical development reported to have difficulty in making preference.**

- **Diane Cotterill(2015) and colleagues,** did a study to explore the challenge of managing finances for people with learning difficulties and to understand the supermarket shopping experiences of people with learning disabilities. They have taken two focus groups consisting of people with learning disabilities and a survey of staff working with people with learning disabilities. Findings from the focus groups and surveys identified a number of themes and sub-themes. ***Theme 1*****-** They found shopping experience promotes independence, choice, engagement in a valued occupation to meet leisure and self care needs and opportunities for social and recreational experience. ***Theme 2***- the environmental barriers to supermarket shopping experiences ***Theme 3:*** Personal barriers.

- ***DEBORAH ROEDDER JOHN 1999*** did study twenty-five years of consumer socialization. In this study author found that there can be no doubt that children are avid consumers and become socialized into this role from an early age. Throughout childhood, children develop the knowledge, skills, and values they will use in making and influencing purchases now and in the future .and an impressive set of findings provides unique insight into the beliefs and behavior of an important consumer segment**. Children 4–12 years** of age spend over $24 billion in direct purchases and influence another $188 billion in family household purchases (McNeal 1998).

- **Kevin M. Ayres, John Langone, Richard T. Boon, and Audrey Norman the University of Georgia, 2006, did** a study to investigate use of computers and video technologies to teach students to correctly make purchases in a community grocery store using the dollar plus purchasing strategy. **Four middle school students diagnosed with intellectual disabilities participated in this study**. A multiple probe across participant's research design was used to evaluate the effectiveness of the treatment. Author found that the program was effective at teaching the dollar plus purchasing strategy to three out of four participants and promoted generalization to the natural environment.

- **Rajul etan daftary MSc (O.T) and Shailaja Jaywant Msc (OT) 2015** conducted a study to explore the efficacy of a cognitive orientation to daily occupational performance approach in improving handwriting skill in school going children. In this study they have taken **8 children between age 7-9 years with IQ>90**, referred to outpatient department of occupational therapy for handwriting performance problems were enrolled in this study. ETCH tests was used as outcome measures. **Each child was seen individually for 10 sessions each consisting of one hour over the period of 2.5 months**. During the intervention session, coop approach i.e., plan, do, check. Method was used to improve handwriting skills in these children. **Result showed all the 8 children had significant improvement** on all the 5 components of ETCH test.

- **Ashleigh Thornton, Melissa Licari, Siobhan Reid, Jodie Armstrong, Rachael Fallows & Catherine Elliott 2015**, did a study to determine; if a **10-week group based Cognitive Orientation to Daily Occupational Performance (CO-OP)** intervention improved outcome measures across the impairment, activity and participation levels of the International Classification of Functioning, Disability and Health (ICF) framework. In this quasi experimental, pre–post-test**, 20 male children aged 8–10 years** with a confirmed diagnosis of DCD participated in either the 10 week group intervention based on the CO-OP framework or in a control period of regular activity for 10 weeks . Outcome measures relating to impairment (MABC-2, motor overflow assessment), activity (Handwriting Speed Test) and participation [Canadian Occupational Performance Measure, (COPM) and Goal Attainment Scale) were measured at weeks 0 and 10 in the intervention group. Author found that Children who participated in the CO-OP intervention displayed improvements in outcome measures for impairment, activity and participation, particularly a reduction in severity of motor overflow.

Parent and child performance and satisfaction ratings on the COPM improved from baseline to week 10 and all goals were achieved at or above the expected outcome. No significant changes were reported for the control group in impairment and activity (participation was not measured for this group.

- **Shanon phelan Laura steinke Angela Mandich 2009** did a study to investigate a new treatment approach (coop) to treating children with PDD. COOP emphasizes problem solving strategies and guided discovery of child and task specification strategies. Three goals were established in collaboration with parents and the child. Pre and post measures of parents perceptions of child performance were identified using COPM. Repeated measures were taken using clinical observations, video analysis, and the performance quality rating scale (PQRS) .In this study they found that improved COPM ratings of performance and satisfaction were observed and these results were paralleled by improved PQRS scores.

- **Deirdre R. Dawson Arvinder Gaya Anne Hunt Brian Levine Carolyn Lemsky Helene J.Polatajko 2009, did a single-case design study used with 3 adults, 5 to 20 years post-TBI** and their self-identified significant others. Assessments included neuropsychological tests and the Canadian Occupational Performance Measure. The intervention entailed guiding participants to use a meta-cognitive problem-solving strategy to perform self-identified daily tasks that they needed and wanted to do and with which they were having difficulties. The intervention occurred over **20 one-hour sessions** in participants' environments and the result found that the CO-OP approach has the potential to improve performance in daily functioning for adults with executive dysfunction following TBI.

- **Sylvia Rodger and Julia Brandenburg 2008** conducted two case studies of children with Aspernger syndrome, illustrating the outcomes of CO-OP to address motor-based occupational performance goals. A case study approach was used to document how two children with AS engaged in **10 weekly sessions of CO-OP** addressing child-chosen motor-based occupational performance goals and the outcomes of this intervention. The author found that Pre and post-intervention assessment using the Canadian Occupational Performance Measure**,** Vineland Adaptive Behavior Scales and the Performance Quality Rating Scale indicated that both

children were able to engage in CO-OP intervention to successfully improve their occupational performance.

- **Shannon Taylor, Nora Fayed, Angela Mandich 2007**, did a single-case design study to determine the effectiveness of using the CO-OP approach with children ages 5 to 7 years. Four children chose three different goals to work on during therapy. Child and parent Canadian Occupational Performance Measure ratings and performance observation ratings at follow-up demonstrated the effectiveness of the CO-OP approach, supporting the use of the CO-OP with younger children and suggesting further research on the CO-OP with younger children is warranted.

- **Clarie A.sangster. Claire beninger Helene J.Polatajko Angela Mandich 2005,** did a pilot study to investigate the use of cognitive strategies in children with DCD to determine whether cognitive strategy use is improved by **COOP Observations of video recorded sessions of 18 school-aged children** were scored for frequency and type of cognitive strategies used Results showed differences within and between groups revealed changes in the type of cognitive strategies. and this support the use of a cognitively based approach such as coop in assisting children with DCD in developing cognitive strategies when solving occupational performance problems.

# CONCEPTUAL FRAMEWORK

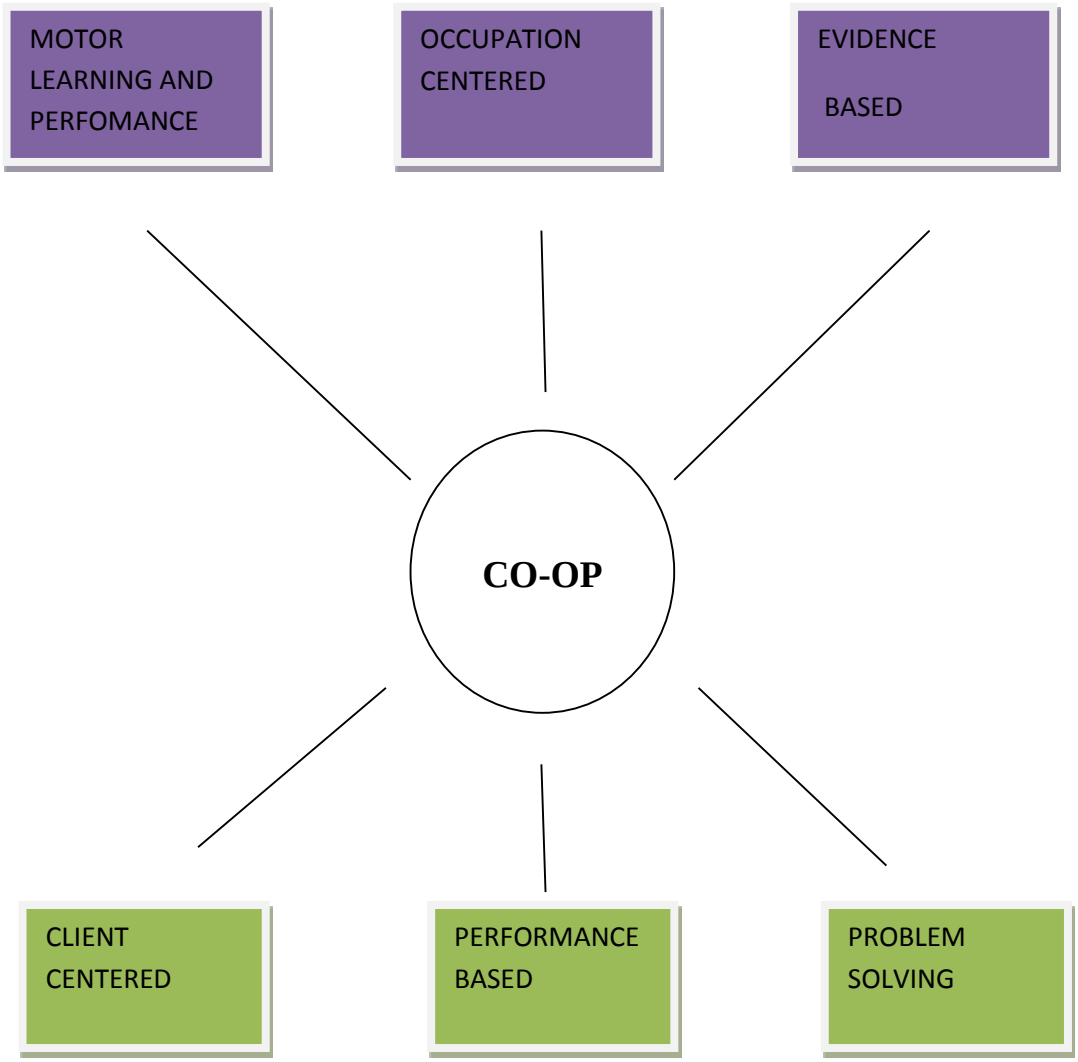
This study is focused on CO-OP (cognitive oriented daily occupational performance). CO-OP is "a client-centered, performance based problem solving approach that enables skill acquisition through a process of strategy use and guided discovery. COOP intervention targets occupations, performance and participation that are purposeful and meaningful to the child in context. [7]

CO-OP approach is derived from the Canadian Model of Occupational Performance and Engagement (CMOP-E) was founded by Polatajko, and Craik in 2007. This model was a further expansion of the Canadian Model of Occupational Performance (CMOP) that was developed by the Canadian Association of Occupational Therapists (CAOT) in 1997. The model identifies the main domains that the profession has an interest in. Engagement was added as a conceptual advancement on the original model as it was identified as an important aspect of human occupation. This advancement was necessitated by the current developments and improvements in knowledge of occupation-based, client centered and evidence-based occupational therapy practice.

In CO-OP, a child-centered or client centered approach is taken and children are encouraged to select their own goals for intervention. At the age at which children participate in CO-OP, their metacognitive skills are developed sufficiently for them to be able to consider their task performance across situations. They are motivated to work on achieving goals that they have set personal. This study focuses on child-chosen goals as an important aspect. Bandura has suggested that children's actual experiences performing an activity contribute most significantly to their self-perceptions.

COOP approach is a verbally based, individualized approach focused on guiding children to discover and learn cognitive strategies to solve motor problems. It is based on theories such as problem solving, performance based, learning theory and cognitive theories

This study focuses children with learning disability who has problem in shopping performance skills, introducing COOP approach to the children to master occupational goals, the crucial role of parents is recognized in terms of their perspectives regarding the child's occupational concerns and strengths, and their role in assisting with strategy generalization and transfer of strategies and skills learned .




- Focusing on child-chosen goals
- Children are motivated to work on achieving goals
- a child can learn and regulate his behavior by instructing himself to identify a goal, develop a plan, enact the plan, and evaluate its success

The interaction of the Individual

The task and

The environment

Self-instructional steps

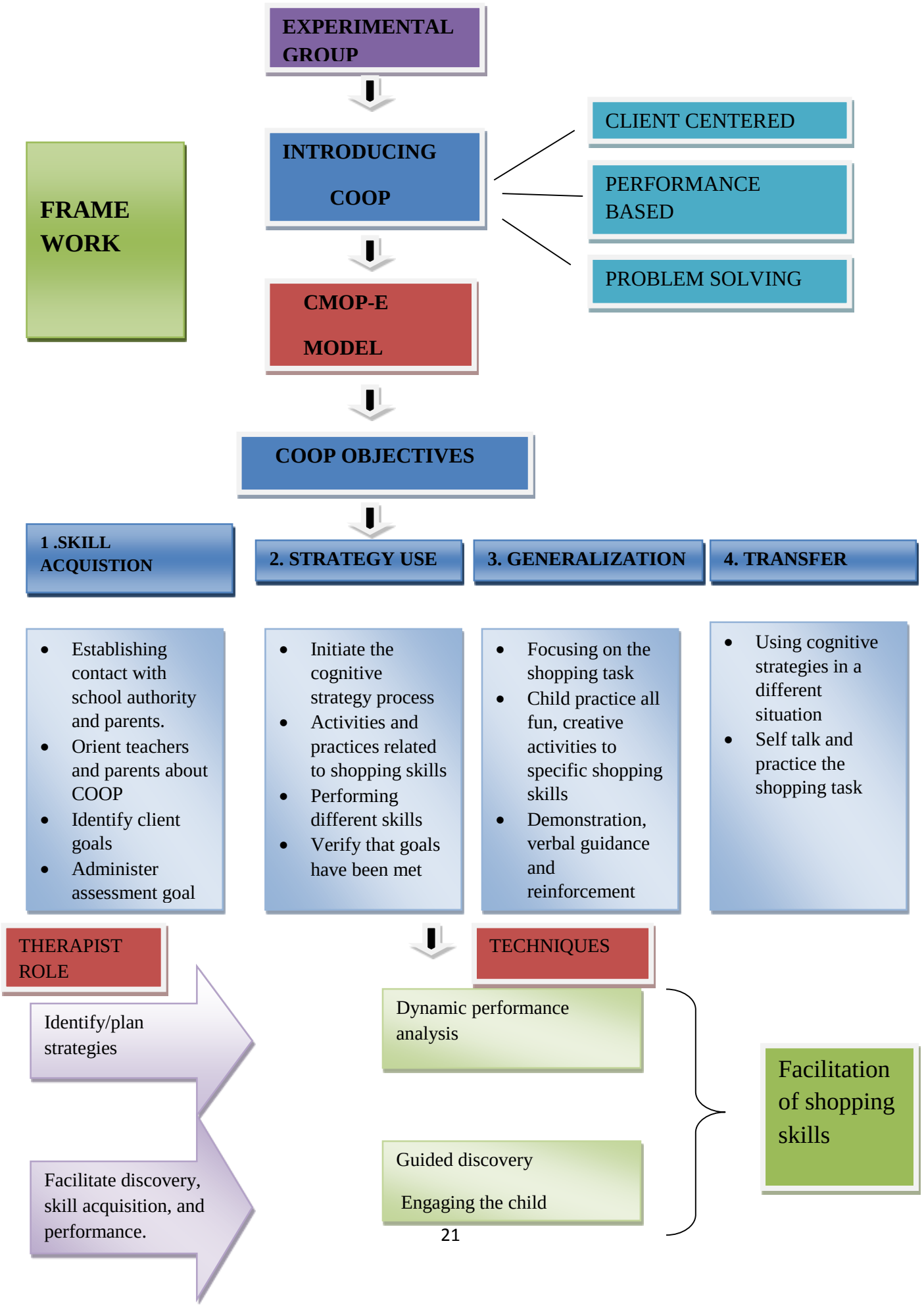
(1) Discovery of the problem;

(2) Investigation of the problem;

(3) Selection of alternative solutions;

(4) Attempt to solve the problem;

(5) Comparison of results of the solution


FRAME WORK
EXPERIMENTAL GROUP
INTRODUCING COOP
CLIENT CENTERED
PERFORMANCE BASED
PROBLEM SOLVING
CMOP-E MODEL
COOP OBJECTIVES
1 .SKILL ACQUISTION
2. STRATEGY USE
3. GENERALIZATION
4. TRANSFER
Establishing contact with school authority and parents.
Orient teachers and parents about COOP
Identify client goals
Administer assessment goal
Initiate the cognitive strategy process
Activities and practices related to shopping skills
Performing different skills
Verify that goals have been met
Focusing on the shopping task
Child practice all fun, creative activities to specific shopping skills
Demonstration, verbal guidance and reinforcement
Using cognitive strategies in a different situation
Self talk and practice the shopping task
THERAPIST ROLE
TECHNIQUES
Identify/plan strategies
Facilitate discovery, skill acquisition, and performance.
Dynamic performance analysis
Guided discovery
Engaging the child
Facilitation of shopping skills

# METHODOLOGY

## PLACE OF STUDY

KMCH occupational therapy department and occupational therapy centers in and around Coimbatore

To administer TOGSS tool - Pazamudhir plus super market at Nehru nagar

## RESEARCH DESIGN

Quasi experimental (two group pretest and post test design)

## POPULATION

- Children diagnosed with learning disability
- Within the age group 10-14 years

## SAMPLE SIZE- 30

- 15 experimental groups
- 15 control groups

## SAMPLING TECHNIQUE

Convenient sampling technique

## SELECTION CRITERIA

### Inclusion criteria

- Children diagnosed with learning disability by psychiatrist
- Children within the age group of 10-14 years
- Both boys and girls are included
- Willingness to participate

### Exclusion criteria

- Children with physical dysfunction
- Children with co-morbid condition like autism

## VARIABLES

### Independent variable

CO-OP (cognitive oriented daily occupational performance)

### Dependent variable

Shopping skills

### Extraneous variable

- Children's receiving occupational therapy regarding money handling and shopping skills
- Environmental exposure
- Social and communication skills

# TOOLS

***1) TOGSS (The Test of Grocery Shopping Skills)***

***2) COPM (Canadian occupational performance measure)***

***3) PQRS (performance quality rating scale)***

**1)** ***The Test of Grocery Shopping Skills (TOGSS)***

It is used to assess a performance of one's ability to shop in the community. It looks at ones executive functioning; specifically the ability to locate and select specific items at the lowest price in a natural environment.

Scoring Procedures:

TOGSS consists of 10 items

Each item receives 3 scores.

Score 1 if the item selected is accurate, if it is right size and if it is lowest price.

Score 0 if the item selected is not accurate, if the size is not correct or if the item is not lowest price

A score is obtained based on the person's ability to efficiently and accurately find the correct items and the lowest price. There are three subscales scores:

- Accuracy: the person's ability to find the correct item at the required size and lowest price.
- Time : how long it took the person to find the item.
- Redundancy: the number of aisles the person entered to look for items and how many times a person returned to the same aisle
- The therapist also uses observation to assess the strategies the person uses to shop (e.g., scanning overhead signs, asking for help, scanning shelves, checking prices

Tally the total of accuracy scores. Add all the item scores, size scores and price scores and place in the total box. There are 30 possible points. Total the time taken to complete the task. (Enter the starting and stopping times.) Identify the minimum number of aisles that must be entered to obtain all items. Subtract this number from the actual number of aisles entered to determine the redundancy score. (Redundancy = actual number of aisles entered – minimum number of aisles needed to find items.) Tally the total number of times participant asked for help Tally the number of times unsolicited help was offered Tally the number of times participant parked the cart

Occupational therapists and other Rehabilitation professional are qualified to use this tool. Need a thorough knowledge of testing manual and instructions before giving test

**Reliability:** Inter-rater and Test-retest were significant. They provided stability and equivalence.

**Inter-rater Reliability _**0.99 Test-retest between the two forms _0.64-0.83_

**Validity**: **Construct Validity**: Subscale scores between the TOGSS and a similar drugstore test was significant from 0.52 – 0.94. TOGSS was significantly correlated to other Neurocognitive measures; Stroop word reading and color naming, verbal memory on the Rey Auditory Verbal Learning Test (RAVLT) and perseveration scores on the Wisconsin Card Sorting Test (WCST).

**Content Validity**: Developed following observation and interview with people who have severe mental illness to determine the various aspects of grocery shopping that proved to be important and yet difficult.

**Time required administering**: Typically 20 – 30 minutes

**2) Canadian occupational performance measure** (Mary law et al., COPM , 3rd edition),is a criterion based measures of occupational performance in which clients rate the level of importance of, performance of, and satisfaction with goals in self-care, productivity, and leisure on a 10-point scale. A change of 2 or more points in the mean score on the COPM has been reported to indicate clinically significant change. The COPM was developed to detect change in self perception of occupational performance and satisfaction over time in person with variety of disabilities.

**Administration and scoring of COPM**

The COPM is an instrument administered in a four step process using a semi structured interview conducted by the therapist together with the client and/ or caregiver. The five steps are

Step1: Problem definition

Step2: Problem weighting

Step3: Scoring

Step4: Re-assessment

Reliability= 0.63 and 0.84

Test retest reliability= 0.79 and 0.75

Internal consistency for performance = 0.41- 0.56 and satisfaction=0.71

**3) Performance quality rating scale (PQRS) (martini & Polatajko, 2004)**

It is a criterion –referenced performance- based observation rating scale. Quality of task performance is rated according to a 10 point scale based on the competency of the performance with a score of 1 indicative of the child being unable to perform the task even in part and score of 10 indicating competent performance.

## PROCEDURE

- Approval from the ethical committee, consent from parents and permission from the institutional head
- Administration TOGSS, COPM and PQRS scale, prior to the intervention
- They were assigned to experimental group and control groups
- Regular occupational therapy and COOP intervention were given to experimental group
- The duration of the intervention was 12 weeks, 36 sessions, thrice in a week
- Regular occupational therapy and money concept training were given to control group
- The duration of each session is 45 minutes to 1 hour
- After 12 weeks of intervention, the post test was taken by using TOGSS (test of grocery shopping skills) scale, COPM and PQRS scale

# COOP INTERVENTION PROTOCOL

| | |
|---|---|
| **Prior to therapy** | Preparation<br>1.establish contact with parents<br>2.orient parents to cognitive orientation to daily occupational performance (coop)<br>3.contract with parents to ensure resources and support<br>4.provide daily activity log<br>5. check for child/ parent and therapist prerequisites |
| | Assessment<br>6. review child's completed activity log<br>7. administer Canadian occupational performance (COPM) and identifying goals<br>8. baseline child's performance using the performance quality rating scale( PQRS) |
| **Session 1** | INTRODUCTON OF GLOBAL COGNITIVE STRATEGY<br>9. introduce global cognitive strategy: goal-plan-do-check<br>1. therapist introduce the puppet, commander goal plan do check<br>2. therapist maps goal-plan-do-check<br>3. child maps goal-plan-do-check to a familiar task<br>4. parents observe session and discuss application of GPDC at home |
| **Session 2-36** | Acquisition- all child identified goals were tackled in this sessions<br>10. conduct dynamic performance analysis: ongoing<br>11. facilitate the child's acquisition and application of the global cognitive strategy: goal-plan-do-check<br>12. Guided discovery of domain specific strategies (DSS) and mediate their application to skill acquisition.<br>13. Apply enabling principles.<br>14.teach parents / caregivers about goal-plan-do-check and applicable domain specific strategies<br>15. educate parents/caregiver about their ongoing role in facilitating cognitive strategy use to promote skill acquisition |
| **Post test** | Consolidation<br>16.readminister COPM<br>17. Re administer baseline , using TOGSS, PQRS<br>18. probe child for generalization and transfer of global and domain specific strategies : GPDC and DSS |

## PRE TEST

### Child Taken the Items which was not Given in the List

**Problem In Getting Correct Change**

**Has difficult in reading the list**

**COOP INTERVENTION**

## COLLAGE AVTIVITY

## GROCERY ITEM SEARCHING ACTIVITY

**Post test**

A) The child was able to take the correct item which was given in the list without any assistance.

C) The child was able to see the price in the items.

B) The child was able to get correct change.

# DATA ANALYSIS AND RESULTS

In this study the data was collected using the TOGSS (Item, Size, and Price), COPM (Performance and Satisfaction), and PQRS Scale before and after the intervention. The data was subjected to statistical analysis by the statistical package for social sciences (SPSS) software version 20

- **Descriptive statistics** was used to find out the mean, SD, minimum and maximum score is shown in table 1,2,3,and 4
- **Mean difference** was calculated by subtracting the post test mean values from the pretest mean values to find out the effectiveness of therapy
- **Effect size** was calculated by dividing the mean change in score by the SD of baseline scores in children who had received an intervention and were expected to change. Effect size is interpreted according to criteria set by Cohen's d. An effect size of 0.0- 0.2 was interpreted as small, 0.3-0.5 as medium, 0.6-2or >2 as greater. Is shown in table 6

  d= M1-M2/S.D

  Where M1 – M2 is mean difference

**Non parametric test:**

**Comparison of the pretest and posttest**

Wilcoxon-signed rank test was used to compare within the group to prove effectiveness of COOP intervention over the regular is shown in table 5(5a, 5b, 5c, and 5d)

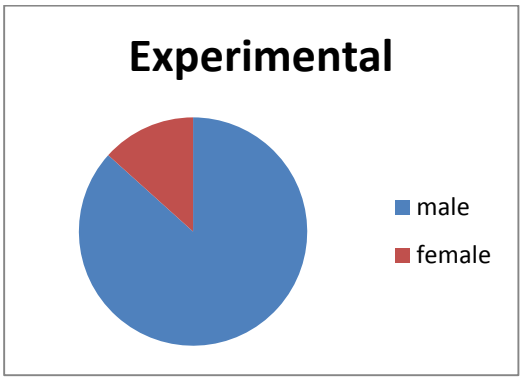
**Comparison between the experimental and the control group**

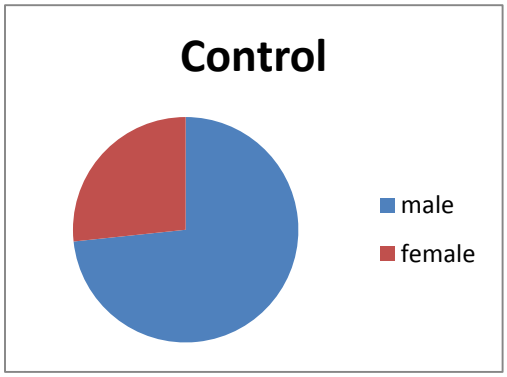
Mann Whitney U test is used to compare between the groups to prove effectiveness of COOP over the regular is shown in table 7(7a, 7b, 7c, and 7d)

**Table 1: Descriptive statistics of the gender and age of the children**

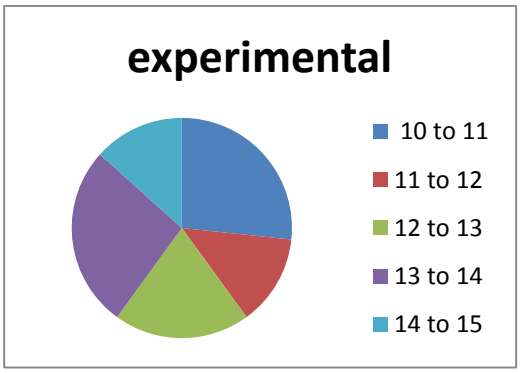
| | | Experimental group | Control group |
|---|---|---|---|
| **Gender** | Boys | 13 | 11 |
| | Girls | 2 | 4 |
| **Age Group** | 10-11 | 4 | 4 |
| | 11-12 | 2 | 2 |
| | 12-13 | 4 | 3 |
| | 13-14 | 3 | 4 |
| | 14-15 | 2 | 2 |

**Graph 1: Descriptive statistics of the gender of the children**




**Graph 2: Descriptive statistics of the age of the children**



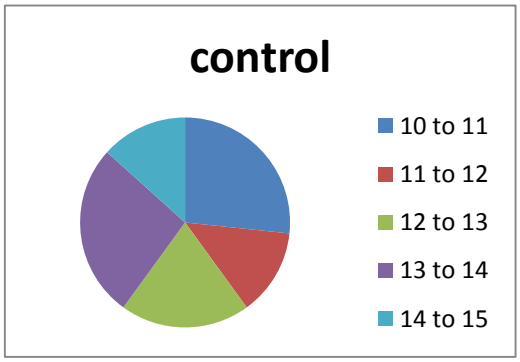



**Table 2: Mean and standard deviation of Test of grocery shopping skills and TOGSS Components**

| Components | | Group | Test | Mean | Std Dev | Min | Max |
|---|---|---|---|---|---|---|---|
| TOGSS Total | | Experimental | Pre test | 7.20 | 4.42 | -1 | 13 |
| | | | Post test | 22.20 | 3.09 | 18 | 27 |
| | | Control | Pre test | 8.07 | 2.40 | 3 | 11 |
| | | | Post test | 15.00 | 2.82 | 10 | 20 |
| TOGSS COMPONENT | Item | Experimental | Pre test | 1.00 | 3.56 | -7 | 6 |
| | | | Post test | 6.33 | 1.44 | 4 | 9 |
| | | Control | Pre test | 1.20 | 1.82 | -2 | 5 |
| | | | Post test | 3.73 | 1.90 | 1 | 7 |
| | Size | Experimental | Pre test | 3.93 | 1.58 | 1 | 6 |
| | | | Post test | 8.27 | 1.48 | 6 | 10 |
| | | Control | Pre test | 4.33 | 1.67 | 2 | 7 |
| | | | Post test | 6.47 | 1.35 | 5 | 9 |
| | Price | Experimental | Pre test | 2.33 | 1.23 | 1 | 5 |
| | | | Post test | 7.00 | 1.69 | 5 | 10 |
| | | Control | Pre test | 2.67 | 1.11 | 1 | 5 |
| | | | Post test | 4.73 | 1.22 | 2 | 6 |
| | Time | Experimental | Pre test | 33.20 | 11.13 | 10 | 46 |
| | | | Post test | 15.00 | 4.00 | 8 | 22 |
| | | Control | Pre test | 39.33 | 5.28 | 26 | 50 |
| | | | Post test | 20.53 | 5.93 | 9 | 28 |

**Table 3: Mean and standard deviation of Canadian occupational performance measure (performance and satisfaction component) and PQRS total**

| Component | Group | Test | Mean | Std Dev | Min | Max |
|---|---|---|---|---|---|---|
| **Performance** | Experimental | Pre test | 37.89 | 7.83 | 19 | 50 |
| | | Post Test | 74.25 | 14.23 | 47 | 94 |
| | Control | Pre Test | 38.49 | 8.12 | 22 | 48 |
| | | Post Test | 43.46 | 7.95 | 29 | 54 |
| **Satisfaction** | Experimental | Pre test | 33.77 | 7.87 | 17 | 45 |
| | | Post test | 74.58 | 14.30 | 47 | 92 |
| | Control | Pre Test | 35.16 | 7.36 | 20 | 44 |
| | | Post Test | 39.64 | 7.66 | 24 | 51 |
| **PQRS total** | Experimental | Pretest | 19.40 | 3.355 | 11 | 23 |
| | | Posttest | 41.13 | 4.291 | 33 | 47 |
| | Control | Pretest | 20.40 | 2.772 | 13 | 24 |
| | | Posttest | 24.67 | 1.589 | 22 | 28 |

**Table 4: Mean and standard deviation of Performance Quality Rating Scale (PQRS) of performance component**

| Components | Group | Test | Mean | Std deviation | Min | Max |
|---|---|---|---|---|---|---|
| **Reading list** | Experimental | Pretest | 3.93 | 1.66 | 1 | 7 |
| | | Posttest | 8.07 | 1.22 | 6 | 10 |
| | Control | Pretest | 4.20 | 0.86 | 3 | 5 |
| | | Posttest | 5.33 | 0.61 | 5 | 7 |
| **Item** | Experimental | Pretest | 3.47 | 1.12 | 2 | 5 |
| | | Posttest | 8.33 | 0.90 | 7 | 10 |
| | Control | Pretest | 4.00 | 0.53 | 3 | 5 |
| | | Posttest | 4.33 | 0.61 | 4 | 6 |
| **Size** | Experimental | Pretest | 3.73 | 1.03 | 2 | 5 |
| | | Posttest | 8.07 | 0.96 | 7 | 10 |
| | Control | Pretest | 3.87 | 0.99 | 2 | 5 |
| | | Posttest | 4.80 | 0.41 | 4 | 5 |
| **Price** | Experimental | Pretest | 3.47 | 1.24 | 1 | 6 |
| | | Posttest | 8.07 | 1.03 | 6 | 10 |
| | Control | Pretest | 3.87 | 0.83 | 2 | 5 |
| | | Posttest | 4.93 | 0.25 | 4 | 5 |
| **Money handling** | Experimental | Pretest | 4.80 | 1.01 | 3 | 7 |
| | | Posttest | 8.53 | 1.06 | 6 | 10 |
| | Control | Pretest | 4.40 | 1.12 | 2 | 6 |
| | | Posttest | 5.27 | 0.79 | 4 | 7 |

## TABLE5: COMPARISON OF PRE-TEST and POST TEST

**Table 5a: Comparison of pre test and post test scores of Test of Grocery Shopping Skills (TOGSS)**

| Group | Test | Positive Ranks | Negative ranks | Ties | Z score | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| **Experimental** | Post test – pretest | 15 | 0 | 0 | -3.412 | **0.001** |
| **Control** | Post test – pretest | 15 | 0 | 0 | -3.415 | **0.001** |

The result shows that there is a significant difference in both experimental group and control group where p is 0.001.

According to the scale high score indicates good/better performance .Thus positive rank indicates (posttest score- pretest score) improvement and vice versa, while ties indicates no improvement.

Positive rank indicates that all children in control and experimental group showed improvement after intervention.

**Graph 3: Comparison of pretest and post test of both groups to measure the TOGSS**

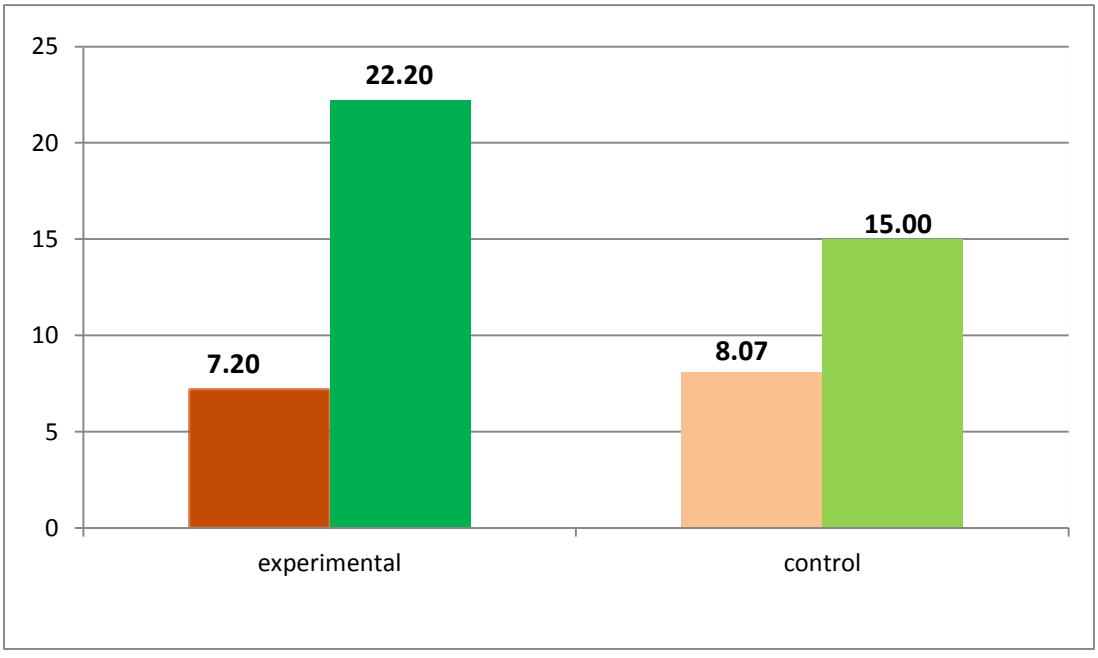


**Table 5b: Comparison of pretest and posttest of Test of Grocery Shopping Skills (TOGSS) accuracy and efficiency of item, size and price component and time taken to complete TOGSS.**

| Group | Components | Test | Positive ranks | Negative ranks | Ties | Z score | Sig. ( 2 tailed) |
|---|---|---|---|---|---|---|---|
| **Experimental** | Item | Post test- pre test | 15 | 0 | 0 | -3.41 | **.001** |
| | Size | Post test-pre test | 14 | 0 | 1 | -3.30 | **.001** |
| | Price | Post test-pre test | 15 | 0 | 0 | -3.41 | **.001** |
| | Time | Post test-pre test | 1 | 14 | 0 | -3.35 | **.001** |
| **Control** | Item | Post test- pre test | 12 | 1 | 2 | -3.09 | **.002** |
| | Size | Post test- pretest | 12 | 2 | 1 | -2.90 | **.004** |
| | Price | Post test- pretest | 12 | 1 | 2 | -2.67 | **.008** |
| | Time | Post test- pretest | 0 | 15 | 0 | -3.41 | **.001** |

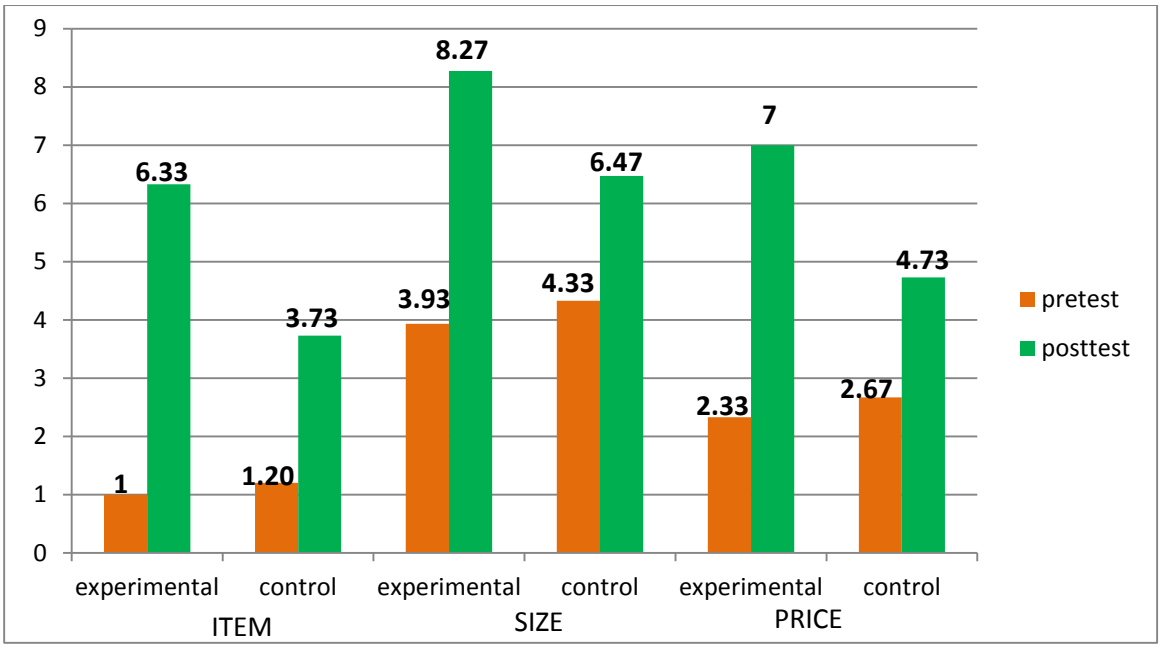
The result shows there is a highly significant difference in item, size, price and time component of TOGSS of the experimental group and control group where p value is (<0.05)

According to the scale high score indicates good performance. Thus positive ranks in item size, and price, indicate (post test score- pre test score) improvement and vice versa, while ties indicates no improvement and negative ranks in time indicate (post test score – pre test score) improvement and vice versa, while ties indicates no improvement.

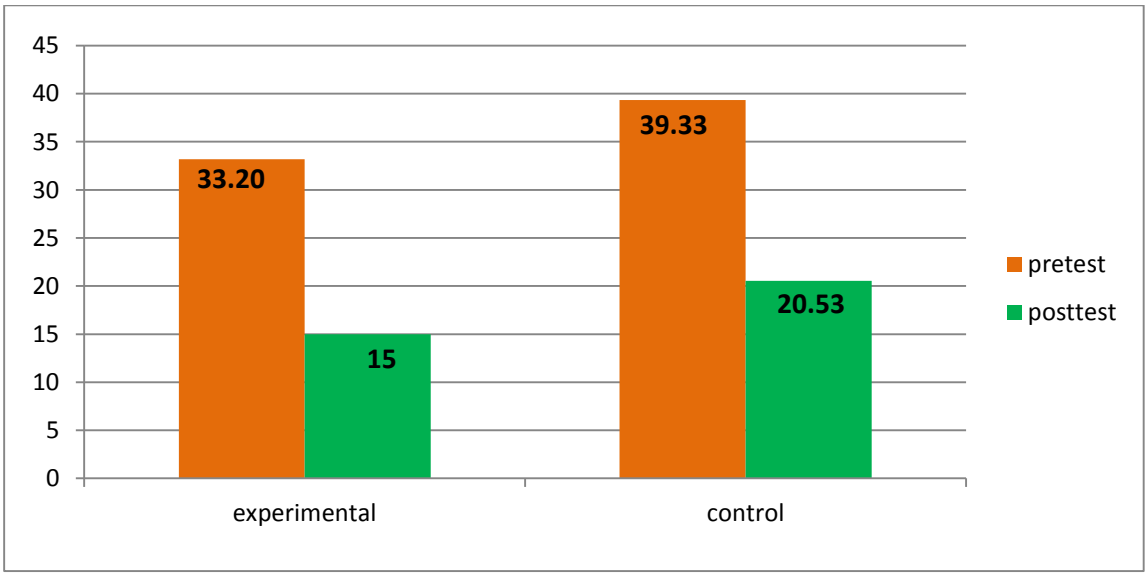
It can be noted that all children in experimental group (expect one in size-ties) showed improvement, where as in control group few children showed detoriation and no improvement.

Graph 4 and 5shows the pictorial representation of these comparisons.

**Graph 4: Comparison of pretest and post test of TOGSS accuracy and efficiency of item, size, and price component**




**Graph 5: Mean score of pretest and posttest of time taken to complete TOGSS**




Note:

Graph 4: The post values of experimental group are much higher than post test values of control group.

Graph 5: The post values of experimental group are lesser than post test values of control group,

**Table 5c: Comparison of pretest and post test scores of COPM and PQRS total**

| Group | Test components | Test | Positive ranks | Negative ranks | ties | Z- score | Sig. ( 2 - tailed) |
|---|---|---|---|---|---|---|---|
| **Experimental** | Performance | Post test-Pretest | 15 | 0 | 0 | -3.409 | **0.001** |
| | Satisfaction | Post test-Pretest | 15 | 0 | 0 | -3.408 | **0.001** |
| | PQRS total | Post test-Pretest | 15 | 0 | 0 | -3.417 | **0.001** |
| **Control** | Performance | Post test-pretest | 15 | 0 | 0 | -3.408 | **0.001** |
| | Satisfaction | Post test-Pretest | 15 | 0 | 0 | -3.409 | **0.001** |
| | PQRS total | Post test-Pretest | 14 | 0 | 1 | -3.307 | **0.001** |

There is a significant difference in performance and satisfaction component of COPM in both experimental and control group where p value is (<0.05).

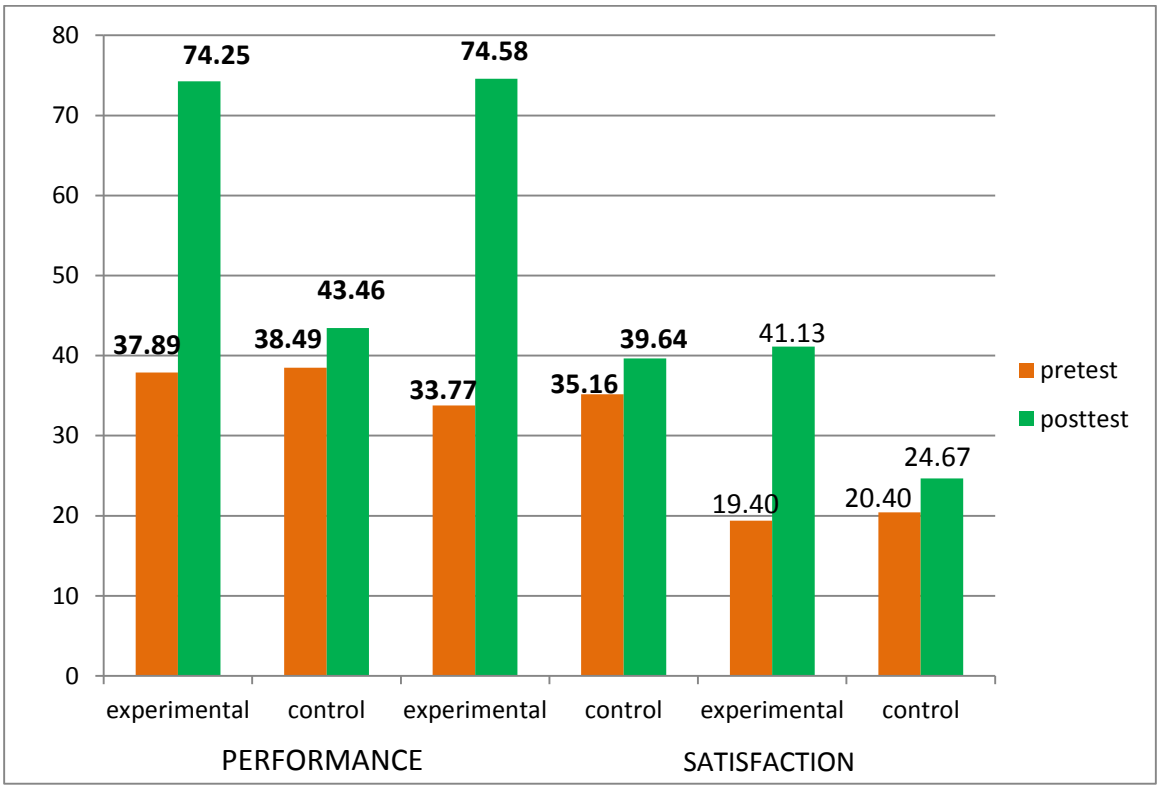
According to the scale high score indicates good performance. Thus positive ranks indicate (post test score- pre test score) improvement and vice versa, while ties indicate no improvement.

The positive rank in experimental group indicates that all children showed improvement in performance, satisfaction and PQRS total after COOP intervention and in control group expect one children in PQRS- ties all children shows improvement in performance, satisfaction and PQRS total

Graph-6 shows the pictorial representation of these comparisons.

**Graph 6:**

**Comparison of pretest and posttest of both groups to measure the performance and the satisfaction level according to COPM**




Note: The post test values of experimental group are much higher than post test values of control group.

**Table 5d: Comparison of pretest and posttest of PQRS of performance component**

| Group | Components | Test | Positive ranks | Negative ranks | Ties | z-score | Sig.(2-tailed) |
|---|---|---|---|---|---|---|---|
| **Experimental** | Reading list | Posttest-pretest | 15 | 0 | 0 | -3.42 | **.001** |
| | Item | Posttest-pretest | 15 | 0 | 0 | -3.47 | **.001** |
| | Size | Posttest-pretest | 15 | 0 | 0 | -3.44 | **.001** |
| | Price | Posttest-pretest | 15 | 0 | 0 | -3.43 | **.001** |
| | Money handling | Posttest-pretest | 15 | 0 | 0 | -3.48 | **.001** |
| **Control** | Reading list | Posttest-pretest | 10 | 0 | 5 | -3.48 | **.004** |
| | Item | Posttest-pretest | 5 | 0 | 10 | -2.23 | **.025** |
| | size | Posttest-pretest | 10 | 0 | 5 | -2.88 | **.004** |
| | price | Posttest-pretest | 11 | 0 | 4 | -3.02 | **.002** |
| | Money handling | Posttest-pretest | 8 | 0 | 7 | -2.56 | **.010** |

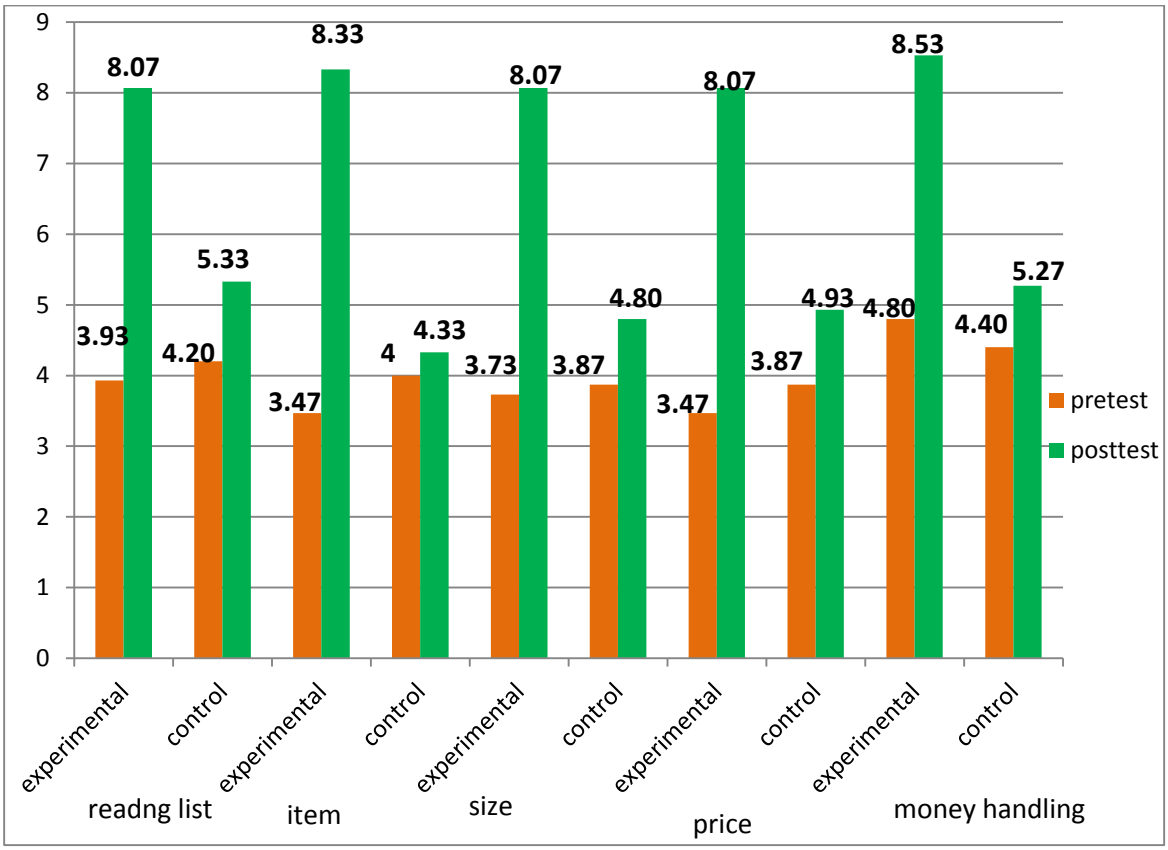
The result shows there is a significant difference in reading list, item, size, price and money handling of the experimental group where p value is (<0.05)

According to the scale high score indicates good performance. Thus positive ranks indicates (post test score- pre test score) improvement and vice versa, while ties indicates no improvement

It can be noted that all children in experimental group showed improvement, where as in control group few children detoriation and no improvement.

Graph 7 shows the pictorial representation of these comparisons

**Graph 7: Comparison of pre test and post test of PQRS performance component.**



## COMPARISON OF EFFECT SIZE

**Table 6: Comparison of effect size on TOGSS, COPM and PQRS scale between experimental and control groups**

| Scale | | Control | | | | Experimental | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Test** | **Mean** | **Std deviation** | **Mean difference** | **Effect size** | **Mean** | **Std deviation** | **Mean difference** | **Effect Size** |
| **TOGSS** | Pre Test | 8.07 | 2.40 | 6.93 | **2.8** | 7.20 | 4.42 | 15 | **3.38** |
| | Post test | 15.00 | 2.82 | | | 22.20 | 3.09 | | |
| **COPM Performance** | Pre test | 38.49 | 8.12 | 4.97 | **0.6** | 37.89 | 7.83 | 36.36 | **4.64** |
| | Post test | 43.46 | 7.95 | | | 74.25 | 14.23 | | |
| **Satisfaction** | Pre test | 35.16 | 7.36 | 4.48 | **0.6** | 33.77 | 7.87 | 9.69 | **1.23** |
| | Post test | 39.64 | 7.66 | | | 43.46 | 7.95 | | |
| **PQRS** | Pre test | 20.40 | 2.77 | 4.27 | **1.5** | 19.40 | 3.35 | 21.73 | **6.4** |
| | Post Test | 24.67 | 1.58 | | | 41.13 | 4.29 | | |

The result shows high effect size in TOGSS, performance and satisfaction component of COPM, and PQRS in experimental group.

## TABLE 7: COMPARISON BETWEEN EXPERIMENTAL AND CONTROL GROUPS

**Table 7a: Comparison between experimental and control groups scores of TOGSS total**

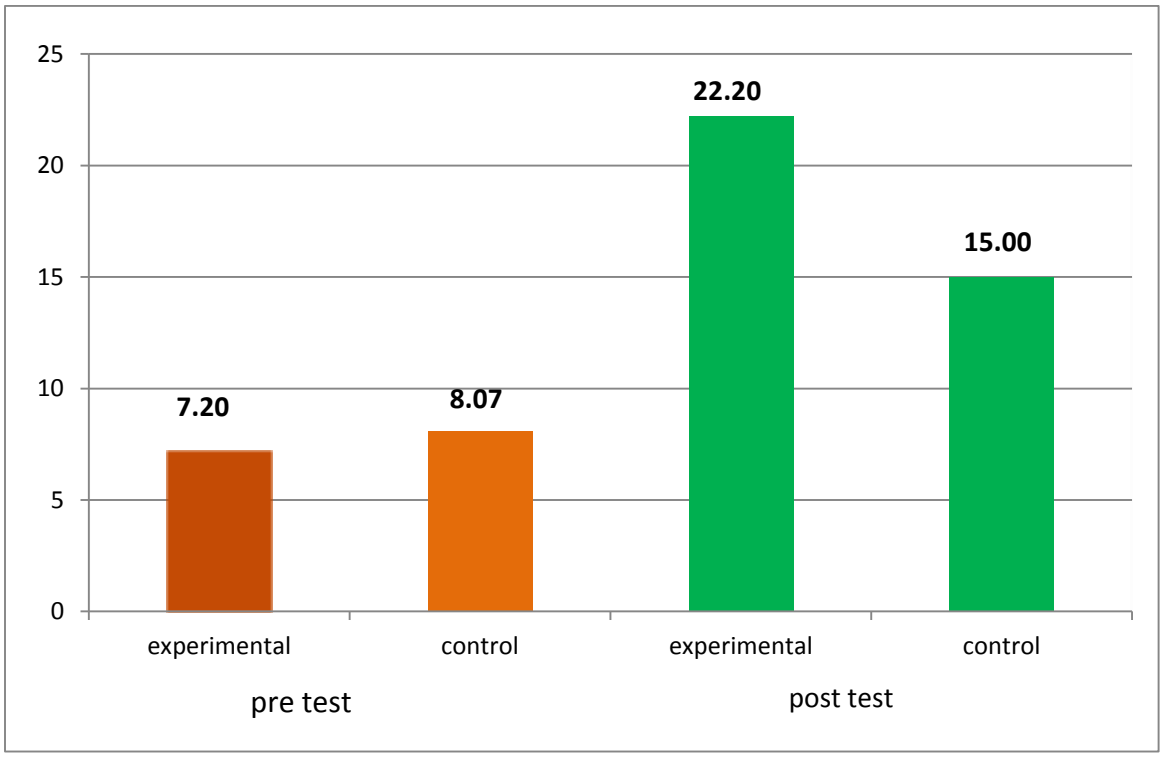
| Test | Group | N | Mean rank | Sum of ranks | U score | Sig (2-tailed) |
|---|---|---|---|---|---|---|
| **Pre test** | Experimental | 15 | 15.03 | 225.50 | 105.5 | .770 |
| | Control | 15 | 15.97 | 239.50 | | |
| **Post test** | Experimental | 15 | 22.57 | 338.50 | 6.5 | **.000** |
| | Control | 15 | 8.43 | 126.50 | | |

The pretest of TOGSS shows that there is no significant where p is (>0.05). This indicates that there is homogeneity of the group and thus post test scores can be compared

There is a significant difference in the post test of TOGSS scale where p is 0.000(<0.05). This indicate that there is improvement in post test

Graph -8 shows the pictorial representation of these comparisons

**Graph 8: Mean score of pretest and post test of both groups to measure the TOGSS**




Graph shows that the post test values of experimental values are much higher than post test values of control group

**Table 7b: Comparison between experimental and control group of scores of TOGSS accuracy and efficiency of item, size and price component**

| Test | Component | Group | N | Mean rank | Sum of ranks | U score | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| **Pre test** | Item | Experimental | 15 | 16.33 | 245.00 | 100.00 | .599 |
| | | Control | 15 | 14.67 | 220.00 | | |
| | Size | Experimental | 15 | 14.63 | 219.50 | 99.50 | .584 |
| | | Control | 15 | 16.37 | 245.50 | | |
| | Price | Experimental | 15 | 14.03 | 210.50 | 90.50 | .344 |
| | | Control | 15 | 16.97 | 254.50 | | |
| | Time | Experimental | 15 | 13.37 | 200.50 | 80.50 | .183 |
| | | Control | 15 | 17.63 | 264.50 | | |
| **Post test** | Item | Experimental | 15 | 20.80 | 312.00 | 33.00 | **.001** |
| | | Control | 15 | 10.20 | 153.00 | | |
| | Size | Experimental | 15 | 20.23 | 303.50 | 41.50 | **.003** |
| | | Control | 15 | 10.77 | 161.50 | | |
| | Price | Experimental | 15 | 20.80 | 312.00 | 33.00 | **.001** |
| | | Control | 15 | 10.20 | 153.00 | | |
| | Time | Experimental | 15 | 11.43 | 171.50 | 51.50 | **.011** |
| | | Control | 15 | 19.57 | 294.50 | | |

The result shows there is a no significant difference in the pre test of TOGSS accuracy and efficiency of item, size and price component where p value is (>0.05). This indicates that there is homogeneity of the group and thus post test scores can be compared.

There is a significant difference in the post test of TOGSS accuracy and efficiency of item, size and price component where p value is (<0.05). This indicate that there is a improvement in post test

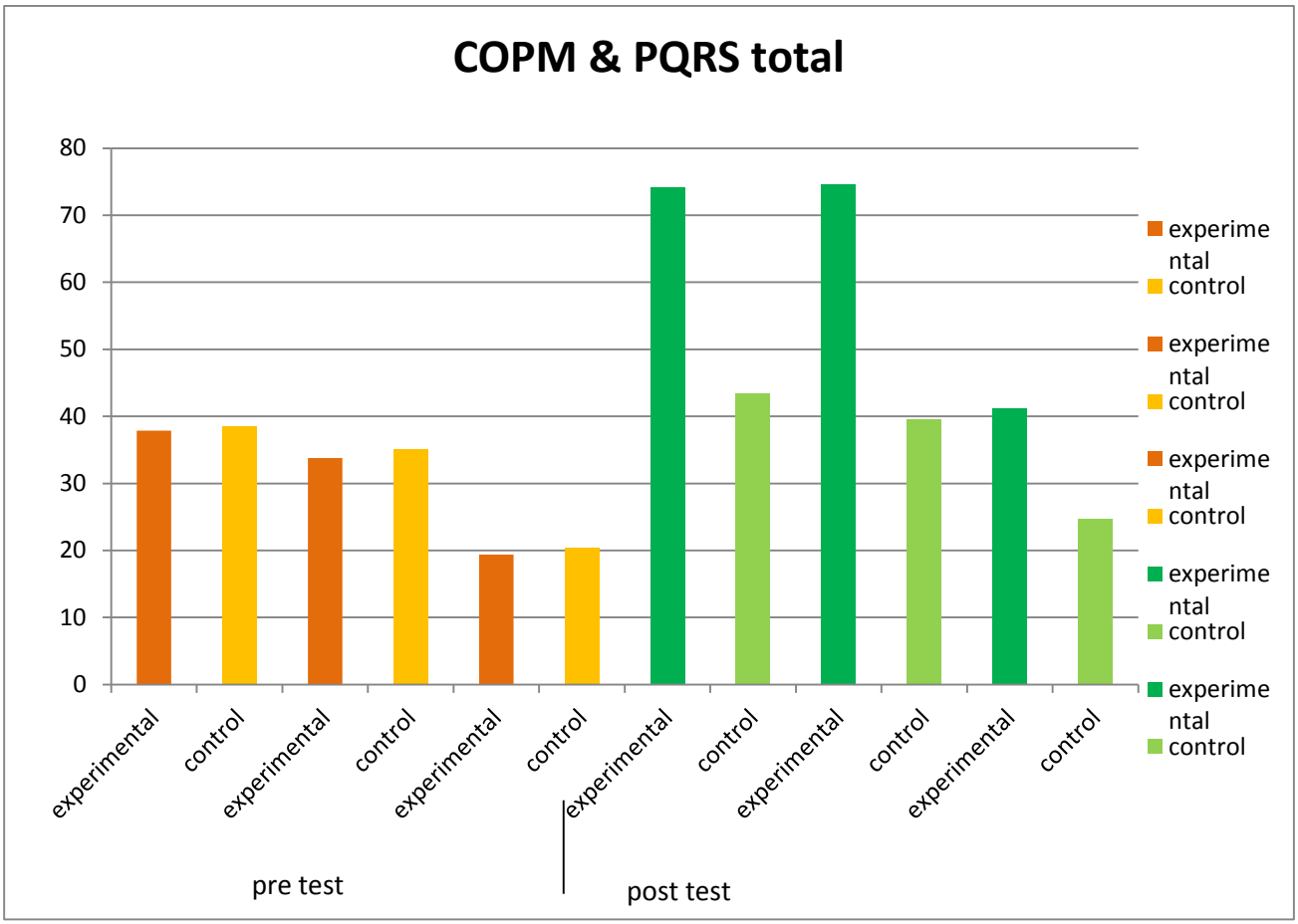
**Table 7c: Comparison between experimental and control group scores of COPM-performance and satisfaction components and PQRS TOTAL.**

| Component | Test | Group | N | Mean rank | Sum of ranks | U score | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| **Pre test** | performance | Experimental | 15 | 15.07 | 226.00 | | |
| | | Control | 15 | 15.93 | 239.00 | 106.000 | .787 |
| | Satisfaction | Experimental | 15 | 14.67 | 220.00 | 100.00 | .604 |
| | | Control | 15 | 16.33 | 245.00 | | |
| | PQRS total | Experimental | 15 | 14.20 | 213.00 | 93.00 | .413 |
| | | Control | 15 | 16.80 | 252.00 | | |
| **Post test** | Performance | Experimental | 15 | 22.50 | 337.50 | 7.500 | **.000** |
| | | Control | 15 | 8.50 | 127.50 | | |
| | Satisfaction | Experimental | 15 | 22.93 | 344.00 | 1.00 | **.000** |
| | | Control | 15 | 8.07 | 121.00 | | |
| | PQRS total | Experimental | 15 | 23.00 | 345.00 | .000 | **.000** |
| | | Control | 15 | 8.00 | 120.00 | | |

The result shows there is no significant difference in the pre test of both performance and satisfaction component of COPM and PQRS total where p value is (>0.05). This indicates that there is homogeneity of the group and thus post test scores can be compared.

The post test values shows that there is a significant difference in COPM (performance and satisfaction component) and PQRS total where p value is (<0.05). This indicates that there is a improvement in post test.

**Graph 9: Comparison between pretest and posttest of both groups to measure the performance and the satisfaction level according to COPM and PQRS total.**




It is noted the post values of experimental group are much higher than control group,

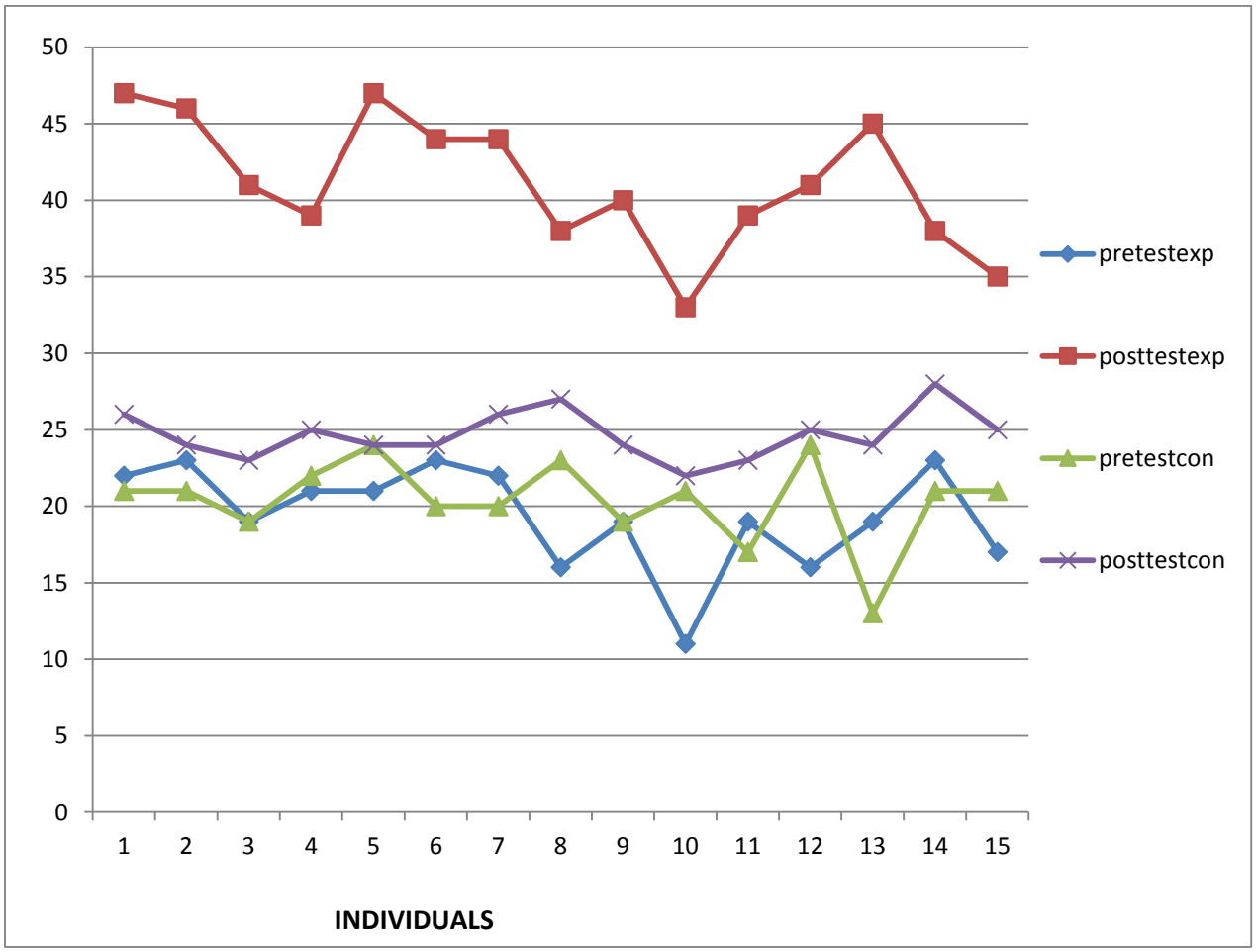
**Table 7d: Comparison between experimental and control groups of scores of PQRS of performance component**

| Test | Components | Group | N | Mean rank | Sum of ranks | U score | Sig.(2-tailed) |
|---|---|---|---|---|---|---|---|
| **Pre test** | Reading list | Experimental | 15 | 14.80 | 222.00 | 102.00 | .651 |
| | | Control | 15 | 16.20 | 243.00 | | |
| | Item | Experimental | 15 | 13.50 | 202.50 | 82.50 | .174 |
| | | Control | 15 | 17.50 | 262.50 | | |
| | Size | Experimental | 15 | 15.00 | 225.00 | 105.00 | .746 |
| | | Control | 15 | 16.00 | 240.00 | | |
| | Price | Experimental | 15 | 13.83 | 207.50 | 87.50 | .270 |
| | | Control | 15 | 17.17 | 257.50 | | |
| | Money handling | Experimental | 15 | 16.60 | 249.00 | 96.00 | .438 |
| | | Control | 15 | 14.40 | 216.00 | | |
| **Post test** | Reading list | Experimental | 15 | 22.67 | 340.00 | 5.00 | **.000** |
| | | Control | 15 | 8.33 | 125.00 | | |
| | Item | Experimental | 15 | 23.00 | 345.00 | .000 | **.000** |
| | | Control | 15 | 8.00 | 120.00 | | |
| | Size | Experimental | 15 | 23.00 | 345.00 | .000 | **.000** |
| | | Control | 15 | 8.00 | 120.00 | | |
| | Price | Experimental | 15 | 23.00 | 345.00 | .000 | **.000** |
| | | Control | 15 | 8.00 | 120.00 | | |
| | Money handling | Experimental | 15 | 22.83 | 342.50 | 2.50 | **.000** |
| | | Control | 15 | 8.17 | 122.50 | | |

The result shows there is no significant difference in the pre test of PQRS performance component where p value is (>0.05). This indicates that there is homogeneity of the group and thus post test scores can be compared.

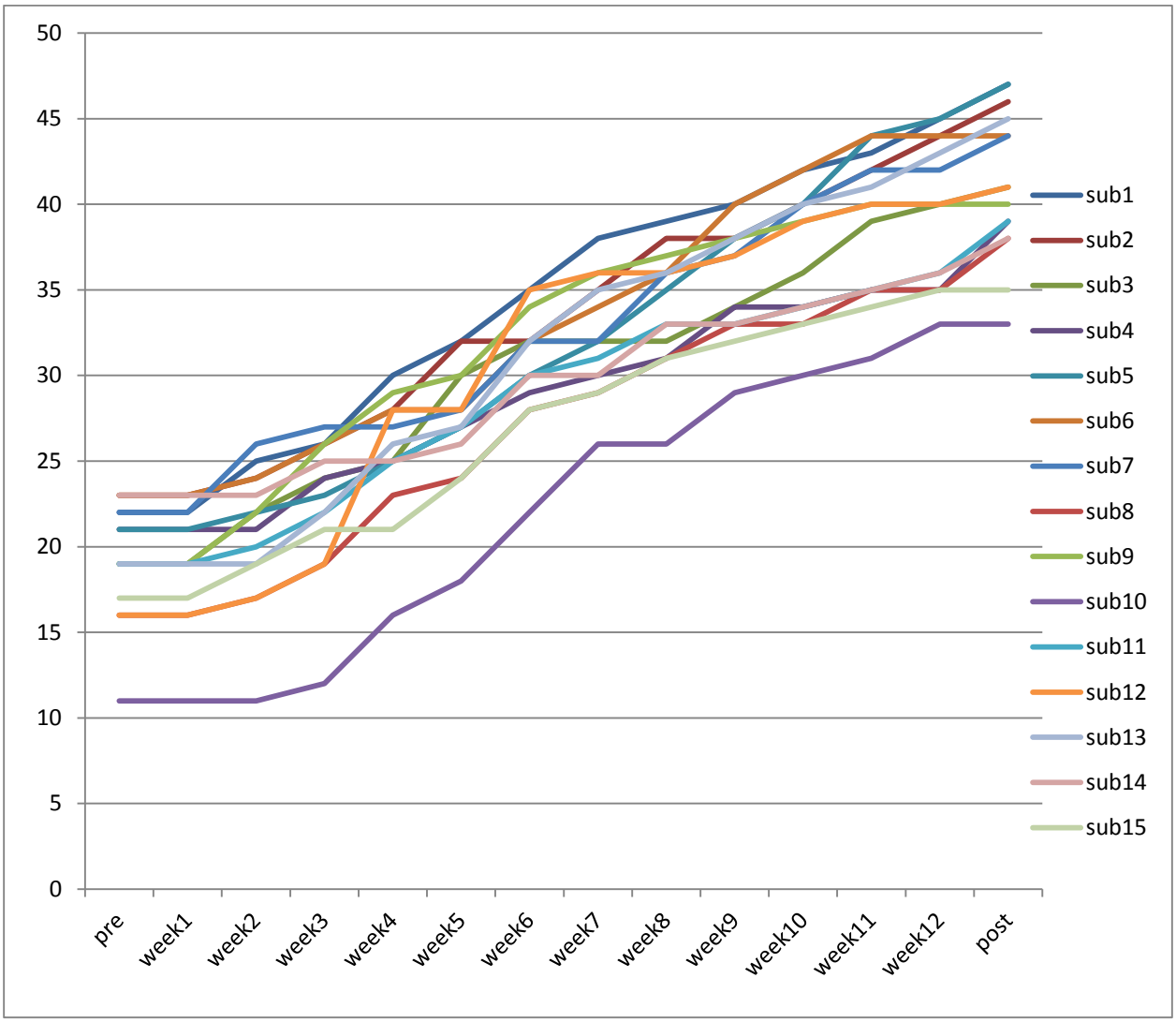
The post test values shows highly significant in PQRS performance component where p value is (<0.05). These indicate that there is a improvement in post test.

**Graph 10: Comparison of individual scores on PQRS**




This graph shows that the post test values of each child in experimental group had shown more improvement than control group.

**Graph 11: Scores of PQRS from 1st week to 12 weeks of experimental group**




The graphs shows all the children PQRS values were increased from pretest, 1week -12 week to posttest indicate COOP was effective.

# DISCUSSION

The study was conducted in Rashmika centre and Cognito Academy in Coimbatore for 36 sessions within 12 weeks. Totally 30 children diagnosed with learning disability based on inclusion and exclusion criteria were included in this study and children were divided into two groups 15 in experimental group and 15 in control group. Assessment tools like TOGSS, COPM and PQRS were used as outcome measures. Experimental group underwent regular occupational therapy and COOP intervention and control group underwent regular occupational therapy and money handling skills training for 36 sessions.

The mean age of children in experimental group was 9.96 and the mean age of children in control group was 9.96, 24 boys and 6 girls was included in both the group.

The shopping skills of children were measured by using TOGSS, for which the children were taken to Pazamudhir supermarket. COPM was used to identify deficit in shopping skills. The children along with parents/ teachers identified 5-6 goals related to shopping which were rated on the importance, performance and satisfaction. And their performance quality was assesses by using PQRS by the investigator.

## IMPROVEMENT IN SHOPPING SKILLS

All 30 children in experimental and control group in baseline assessment had difficulties during shopping like they had problem in planning and organizing i.e., forgets to take cart before taking items in the list, difficulty in reading list, Few took item as they wished, difficulty in taking correct size of an item, asked help from the assistants at shopping center many times during shopping, missed item in the list, time management was problematic, had problem in getting correct change.

In experimental group improvements were noted like all the children were able to plan and organize the task, when shopping list were given the researcher could observe that all the children were able to apply COOP protocol such as talking to self about the task and they can plan themselves before entering the supermarket. Took cart before taking items in the list, started to read the list fully and then they started to search the item, able to see the price in the item and can choose the item which is of lowest price. Time taken to complete the shopping task is decreased;

and they were able to get correct change of what they had purchased. Researcher observed all the children's Independence and confident level is had increased more than baseline assessment.

During pretest children had a tendency to impulsively take what they like (panneer, baby corn, cauliflower, butter, milk) than what was given in the list. At post test children in experimental group could control self and confined to the list given.

The Experimental group in current study is based on COOP intervention, COOP has specified treatment protocol and there is a strong convergent evidence that CO-OP is an effective approach for use with children with DCD (also called motor learning disability) [9].

Statistical analysis of pretest and posttest scores of TOGSS shown in Table: 5a where p is 0.001(<0.05) expressing the positive effect of COOP approach on children with learning disability in experimental group.

The mean difference between pretest and post test values of TOGSS(exp-15, control-6.93) and TOGSS accuracy and efficiency of item, size, and price component(exp-5.33,4.34, 4.67 and control-2.53,2.14 ,2.06) for experimental and control group respectively, shows that experimental group has improved more than the control group. The increased improvement noted in experimental group can be assumed that COOP was effective to improve shopping skills in children with learning disability

Table 5b shows statistical analysis of pretest and post test of TOGSS accuracy and efficiency of item, size, price, and time component in this table where p is 0.001 (<0.05) shows significant difference in between the values, The positive rank in experimental group indicates that all children showed improvement after COOP intervention this correlates with the study done by Delredon R. Dawson, Helena .J. Polatajko COOP in adults with TBI , shows COOP approach is an effective way of improving participation in daily life(shopping skills) for adults with executive dysfunction following TBI.**[10]**

Dysasale, J., Casey, J., & Porter- Armstrong, A. **[11]** (2008), investigated on community skill training (children were taken to local shops) and classroom training (instructions, role-play, group exercise, games and discussion about financial tasks) to facilitate shopping skills, and concluded as both intervention program were equally effective. The control group in current study had undergone

similar to classroom training, i.e., instructions, games etc related to money concept and handling which also has shown to be effective table no 5a

However, during observation of posttest shopping evaluation, it was found that children in control group showed decreased confidence, had difficulty planning their task, took more help from assistance at shopping center difficulty in reading list taking correct item, correct size and getting correct change.

The control group also shows significant difference but when compared to experimental group. The experimental group has improved more than control group.

Effect size (table no-6) calculated shows greater effect size in all components for experimental group and medium to greater effect size on components in control group. The increased improvement noted in experimental group can be assumed that COOP was effective to improve shopping skills in children with learning disability.

**COPM, PQRS AND COOP INTERVENTION:**

COPM was used to help children to identify the 5-6 skills they needed, wanted or were expected to perform that were difficult for them to perform during shopping task. After pretest evaluation which was real life shopping experience, the children could identify easily about their difficulties.

children in experimental group they identified the skill which was needed for shopping task were, they have to improve reading skills, to improve their searching abilities, the skills to take correct item and size and lowest price, ability to plan and organize the task and money handling skills(to get correct change).

COPM also addressed the skill acquisition and transfer skills which is part of COOP intervention. CO-OP is a Self-instruction training concepts were used and the children were actively encouraged to use the goal-plan-do-check strategy to verbally guide themselves in learning to perform the three skills they had chosen. The children were invited to become members and solve the performance mysteries of the skills they had chosen to learn. Parents were invited to be present when a child performs.

The activity chosen by child was collage, searching grocery items in newspaper, collecting letters to frame a grocery or vegetable or fruits word with paper cups, map search task, word search task, playing games like purchasing items in shop, role play, games to find price of an item etc. at the end of session child was discussed with researcher how the activity was helpful and for generalization of shopping.

And PQRS were performance qualities of child when perform shopping task were rated by therapist.

Statistical analysis of pretest and posttest of COPM and PQRS in table 5c shows [where p is 0.001(<0.05) ] expresses the positive effect of COOP approach on children with learning disability in experimental group this correlates with the study done by Rajul etan Daftary on improving handwriting skills by using COOP which shows significant difference in all the 8 students performance and satisfaction (COPM) and PQRS therapist10 point rating scale none of the children in posttest score result was below his pretest score showed positive improvement[12]

The mean difference between pretest and post test values of COPM in performance component (exp 36.36 and con-4.97) and in satisfaction component (exp-40.81, con- 4.48) for experimental and control group respectively, shows that experimental group has improved more than the control group. The increased improvement noted in experimental group can be assumed that COOP was effective to improve shopping skills in children with learning disability this correlates with the study done by Sylvia Rodger and Julia Brandenburg on improving the motor based occupational performance by using COOP in Aspernger syndrome results shows pretest and posttest intervention, COPM mean performance change score was 5.6 and satisfaction change score was 3.9 these changes in scores both represent clinically significant difference between pretest and posttest. Rating also indicating perception of clinically significant changes in both performance and satisfaction[13]

Table 5c shows statistical analysis of pretest and post test of PQRS of performance component in reading list, item, size, and price and money handling component in this table14where p is 0.001and 0.000 (<0.05) shows the positive rank in experimental group indicates that all children showed improvement after COOP intervention this correlates with the study done by Shannon Taylor, Nora Fayed , Angela Mandich done study in COOP for children with DCD the results

shows all the four children in this study showed noticeable improvements in their chosen tasks from the baseline to posttest phase as demonstrated in this PQRS[14].

The mean difference between pretest and post test values of PQRS (exp-21.73, control-4.27) and PQRS each performance component (exp-4.14, 4.86, 4.34, 4.6, 3.73) and control-1.13, 0.33, 0.93, 1.06, 0.87) for experimental and control group respectively, shows that experimental group has improved more than the control group.

Table 6 shows effect size of COPM and PQRS both groups, the result shows that there was increased effect size in experimental group. In control group there was small increase in effect size in COPM and PQRS

Within group analysis of control group also shows significant difference (table no 5c) indicating that the controlled group children also showed improvement in the shopping skills. This may be the children's in control group performed task with help (like asking salesgirls to read list, where the item is placed , and asked to check items were low priced)

Overall the control group also shows significant difference but when compared to experimental group. The experimental group has improved more than control group. The increased improvement noted in experimental group can be assumed that COOP was effective to improve shopping skills in children with learning disability, COPM and PQRS data indicated that the children learned to perform skills that they had found difficult.

**EFFECTIVENESS OF COOP INTERVENTION**

The many other intervention were also used to improve shopping skills (like community based, computer based and class room strategies) and showed effectiveness. Where goals or problem were identified by therapist and therapist choices of activities

In COOP, goals and problem were identified by child and activities also chosen by child to improve their skills in which they had difficulty.

CO-OP not only improves skills also make them independent and made the children to be confident in his/ her task.

Though teaching money concept and money handling help in facilitating shopping skills, COOP shows higher improvement. COOP uses client centered approach so children identified problems, problem based approach so that child identified problems only are tackled and use of cognitive strategies, which helps them to generalize the problem solving skills. Thus CO-OP can be a promising approach in facilitating shopping skills in children with learning disability.

# CONCLUSION

COOP approach showed significant improvement in shopping skills for learning disability children, they were satisfied with their performance. Thus COOP approach is effective in improving shopping skills for learning disability children.

# LIMITATIONS AND RECOMMENDATIONS

## LIMITATIONS

- The regular therapy for children given by different therapists may also have had an effect on both the experiment and control group
- Parents are not regular in participating in  intervention
- At post test evaluation, the same shopping center was familiar to the children, which would have had an effect on the post test values.

## RECOMMENDATIONS

- To do in large sample size
- The current intervention protocol can be used in High functioning autism, ADHD.

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# SCALES

TOGSS FORM 1

Participant I.D

Date

Tester

Testing period (circle) : baseline post- intervention

Shopping list

½ dozen bananas

250 ml of curd

2 small packets of noodles

1 small packet of biscuits

50 ml Honey

Pencils – 2

Erasers – 1

90 pages note – 1

Tooth brush – 1

½ liter water bottle

TOTAL

**TOGSS FORM 1**

**participant ID** ___ **Date** _____ **Tester** _____

**Testing period:** **Baseline** **post-intervention**

**TEST OF GROCERY SHOPPING SKILLS FORM 1**
**SCORE SHEET**

**TIME SCORE**

**Starting time (time participant begins shopping)** _____

**stopping time (time participant enters checkout line)** _____

**Total time** _____

**ACCURACY SCORE**

**Score 1 if correct or lowest and 0 if not correct or lowest**

| Order found | Item | Correct item | Correct size | Lowest price | Lowest priced brand name |
|---|---|---|---|---|---|
| | 1/2 dozen Banana | | | | |
| | 250 ml of Curd | | | | |
| | 2 small packets of Noodles | | | | |
| | 1 small packet of Biscuits | | | | |
| | 50 ml of honey | | | | |
| | Pencils –2 | | | | |
| | Eraser -1 | | | | |
| | 90 pages note -1 | | | | |
| | Tooth brush—1 | | | | |
| | ½ liter water bottle | | | | |
| | | | | | |
| | **Total** | | | | |

# TOGSS FORM 2

Participant I.D

Date

Tester

Testing period (circle) : baseline post- intervention

## Shopping list

½ kg of tomato

500grams of sugar

2 small packets of noodles

500ml of milk

250 gram of tomato sauce

250 gram of chips

100 gram of jam

Pen 1

Crayons - 1 box

50 gram of soap

TOTAL

**TOGSS FORM 2**

**participant ID** _____ **Date** _____ **Tester** _____

**Testing period:** **Baseline** **post-intervention**

**TEST OF GROCERY** **SHOPPING SKILLS FORM 2**
**SCORE SHEET**

**TIME SCORE**
**Starting time (time participant begins shopping)** _____

**stopping time (time participant enters checkout line)** _____

**Total time** _____

**ACCURACY**
**SCORE**
**Score 1 if correct or lowest and 0 if not correct or lowest** _____

| Order found | Item | Correct item | Correct size | Lowest price | Lowest priced brand name |
|---|---|---|---|---|---|
| | 1/2 kg Tomato | | | | |
| | 500gram of Sugar | | | | |
| | 2 small packets of Noodles | | | | |
| | 500 ml of Milk | | | | |
| | 250 gram of Tomato sauce | | | | |
| | 250 gram of Chips | | | | |
| | 100 gram of Jam | | | | |
| | Pen—1 | | | | |
| | Crayons--1box | | | | |
| | 50gram of Soap | | | | |
| | | | | | |
| | **Total** | | | | |

**CANADIAN OCCUPATIONAL PERFORMANCE MEASURE (COPM)**

## Performance

How do you rate the way you do this activity now

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Not able to do at all<br>Low score | | | | | | Able to do extremely well<br>Good score | | | |

## satisfaction

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Not able to do at all<br>Low score | | | | | | Able to do extremely well<br>Good score | | | |

**PERFORMANCE QUALITY RATING SCALE (PQRS)**

10 Point Rating Scale

Name _____

Therapist _____

Date-Pre _____ Date-Post _____

| | Goal | | | | | | | | | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 _____ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | _____ |
| 2 _____ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | _____ |
| 3 _____ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | _____ |

# KMCH ETHICS COMMITTEE
## KOVAI MEDICAL CENTER AND HOSPITAL LIMITED

Post Box No. 3209, Avanashi Road, Coimbatore - 641 014. INDIA
✆ : (0422) 4323800, 4323619 Fax : (0422) 4270805
E-mail : ethics@kmchhospitals.com
EC Reg. No : ECR / 112 / Inst / TN / 2013


**Ref: EC/AP/511/02/2017**
**13.02.2017**

**To**
**Mrs.S.Sugi** MOT (Pediatrics)
Professor
KMCH college of Occupational Therapy
KMCH Campus, Avinashi Road
Coimbatore-641 014

**Dear Mrs.S.Sugi,**

The proposal entitled **"Effectiveness of CO-OP to improve shopping skills in children with learning disability"** Submitted by **Ms.Madhumala K,** under your guidance was reviewed by the Ethics Committee in its meeting held on 11.02.2017 and permission is granted to carry out the study at Kovai Medical Center and Hospital Ltd, Coimbatore, India.

Thanking you,

Yours faithfully,

Dr. P. R. Muthuswamy
Chairman, KMCH Ethics Committee

13/2/17

Dr. P. R. MUTHUSWAMY,
MA.,MBA.,FDPM(IIM-A)Ph.D.
Chairman
Ethics Committee
Kovai Medical Center and Hospital
Avanashi Road,
COIMBATORE-641 014.

**Copy to: Clinical guide:**
**Dr.K.Rajendran,** M.D(paed)
Consultant Paediatrician and Neonatologist
Kovai Medical Center and Hospital

Cognito ACADEMY FOR LEARNING ACHIEVEMENT
கற்க கசடற...

**Dr. N. Lakshmanan** M.A., M.Phil., PhD.,
Director and Clinical Psychologist

17.11.2016

# TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Madhumala.K** is permitted to do her project titled **"Effectiveness of COOP to improve shopping skills in children with Learning Disability".**

Duration of the project is Twelve weeks .

Yours sincerely,

Dr.N.LAKSHMANAN.M.A.,MPHIL (M&SP).,PhD.,

CONSULTANT CLINICAL PSYCHOLOGIST

RCI.Reg.No:A-25341

Rashmika

# Rashmika Centre for Learning & Counselling

(Run with the Technical Assistance of Madras Dyslexia Association)
No : 14, Gandhi Nagar, Near Indian Overseas Bank,
Nanjundapuram Road, Coimbatore - 641 036.

21st Oct'16.

**To**

Mrs. Sujatha Missal. M.Sc (O.T)

Dept.of Occupational Therapy

KMCH

Coimbatore.

**Respected Madam**

**Sub : Granting Permission to conduct a study**

This is to inform you that Ms. Madhumala. K of IInd year M.O.T has been granted permission to conduct the study on " Effectiveness of COOP to improve shopping skills in children with Learning Disability" in our organization.

Yours sincerely

Mrs. Elizabeth Suresh

(Principal)